

LIBRARY.
OR. MR. GENERAL'S OFFICE.
Rec'd
Section
18

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by David Williams, Nos. 96, 98, 100 & 102 Reade St., New York.

Vol. LII: No. 26.

New York, Thursday, December 28, 1893.

\$4.50 a Year, including Postage
Single Copies, Ten Cents.

Reading Matter Contents . . . page 1185
Classified List of Advertisers . . . 91
Alphabetical Index to Advertisers " 95
Advertising and Subscription Rates " 1203



Send for circular "I" to
SHULTZ BELTING CO.,
ST. LOUIS, MO.
NEW YORK, N. Y., 225 Pearl St., A. B. Laurence, Mgr.
BOSTON, MASS., 184 Summer St., G. J. Kelley, Mgr.
PHILADELPHIA, PA., 129 N. 3d St., J. Garnett, Mgr.

TUDOR IRON WORKS,

ST. LOUIS.

Manufacturers of

**HARROW TEETH, MINING RAILS,
SPIKES,**

TRACK FASTENINGS.

Every Hardware and Mill Supply Dealer
Should Sell Bristol's Patent



THE BRISTOLS' MFG. CO., Waterbury, Conn.
New York Office, 121 Liberty St.

BRAIDED CORD.



Send for Samples.

Sash Cord, Bell Cord, Clothes Lines, Masons' Lines, &c.
SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES.



BRANCH OFFICE: 136 Liberty St., New York.
Cleveland City Forge and Iron Co., Cleveland, O.

TO RENT,

ONE HALF OR MORE OF

NEW YORK STORE,

20 MURRAY ST., N. Y.

Will rent Office or Desk Room,
Floor Space, Storage in Basement,
together or separately.

Location is central for Hardware,
Brass and Metal Goods and other
trades.

Store is lighted by Electricity and
Gas, well heated by Furnace and
has Local and Long Distance Tele-
phone connection.

For particulars call or address

D. A. GOODRICH, 20 Murray St., N. Y.

WE HEREBY GUARANTEE THE FOLLOWING ARMS

When Used with U. S. Ammunition:

Colt, Winchester, Marlin, Bu. Whitney, Smith & Wes-
son, Ballard, Stevens, Wesson, Remington and others of first-
class manufacture.

WE ALSO GUARANTEE ALL OUR AMMUNITION.

THE UNION METALLIC CARTRIDGE CO., BRIDGEPORT, CONN.

N. B.—Many of the above named manufacturers will guarantee their
arms Only when U. M. C. Ammunition is used.

RANDOLPH & CLOWES,

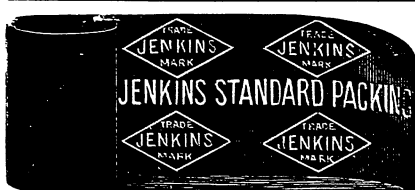
WATERBURY, - CONN.

Western Depot, 71 West Washington St., Chicago, Ill.

Branch Offices: 104 John St., New York.
423 Chestnut St., Philadelphia, Pa.
21 Milk St., Boston, Mass.
Room 208 Neave Building, Cincinnati, O.

SEAMLESS DRAWN BRASS AND COPPER TUBING.

Hot and Cold Rolled Sheet Copper and Brass of all kinds.



JENKINS' STANDARD PACKING

For Steam or Joint Packing has no superior. It
is manufactured in all thicknesses. It is not
loaded to increase weight. Does not ROT or
BURN OUT. Every sheet is stamped with Trade
Mark, like cut.

JENKINS BROS.,

New York, Philadelphia, Boston and Chicago.

THE WILMOT & HOBBS MFG. COMPANY,

MAIN OFFICE, MILLS AND FACTORIES AT

BRIDGEPORT, CONN.

STORE, 20 MURRAY ST., NEW YORK.

(CONNECTED BY TELEPHONE.)

BESSEMER, OPEN HEARTH,

And the Celebrated and Unequaled

"SWEDOH"

(REGISTERED TRADE-MARK.)

Annual Capacity 15,000 Tons
Cold Rolled Steel.

Annual Capacity 30,000 Tons
Hot Rolled Steel.

HOT and COLD ROLLED STEEL.

Used for all Pressed, Stamped and Drawn Work. Easily Brass, Copper, Bronze or Nickel Plated, Tinned
or Japanned. Furnished with plain Blue, Pickled, Annealed or Bright Surface, and with Round
Edges or Sheared to Exact width, Coiled or Cut to Lengths, and in any Degree of Stiffness or
Ductility required. SEND FOR NEW STEEL DEPARTMENT PAMPHLET. For samples of the difficult
stamped and drawn work which can be made from "Swedoh" Steel, call at any Hardware
Store and ask to be shown our "Anti-Rust Copperized C. R. SWEDOH Steel OILERS."

Rainey Connellsville Furnace and Foundry Coke.

The only Coke you can buy and know you are getting the best that can be manufactured. All our works in
the heart of the Region, within four miles of Connellsville, Pa.

CAPACITY, 4,000 TONS DAILY.

W. J. RAINEY,

MAIN OFFICE:
Mercantile Bank Building.

CLEVELAND, OHIO.

THE
ANSONIA BRASS
AND **COPPER CO.**
MANUFACTURERS OF
BRASS AND COPPER

Seamless Tubes, Sheets, Rods and Wire.

Ingot Copper.

SOLE MANUFACTURERS

Tobin Bronze

(TRADE-MARK.)

Condenser Plates, Pump Linings, Wire, Round,
Square and Hexagon Bars, for Pump
Piston Rods and Bolt Forgings.

19 & 21 Cliff Street, - - New York.

THE
New Haven Copper Co.,

SOLE MAKERS OF

POLISHED COPPER

Under Patent of T. James, Sept. 12, 1876.

ALSO MANUFACTURERS AND
DEALERS IN

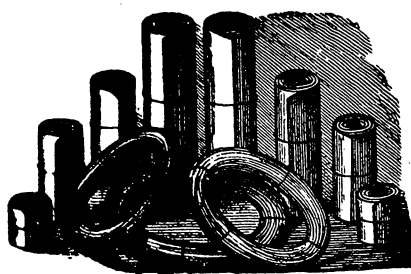
BRAZIERS' & SHEATHING COPPER,

Kettles, Bottoms, Bolts, Circles, &c.,

ALSO MANUFACTURERS OF

Cast Steel Augers and Bits of Superior Quality.

294 Pearl St., NEW YORK.



Waterbury Brass Co.

Established 1845.

Sheet, Roll and Platers' Brass,

German Silver, Copper, Brass and Ger-
man Silver Wire, Brass and
Copper Tubing.

**COPPER RIVETS AND BURS
PERCUSSION CAPS,
TAPE MEASURES,
METALLIC EYELETS,**

Brass Kettles, Brass Tags, Powder Flasks,
Shot Pouches, &c.,

AND SMALL BRASS WARES OF EVERY DESCRIPTION.
HICK'S PRIMERS. BERDAN PRIMERS.

*Cartridge Metal in Sheets or
Shells a Specialty.*

Sole Agents for the CAPEWELL MFG. CO.'S
Line of Sporting Goods.

DEPOTS:

296 Broadway, New York. 125 Eddy St., Provi-
dence, R. I.

MILLS AT WATERBURY, CONN.

**The Metal Worker's Handy-Book
OF RECEIPTS AND PROCESSES,**

BEING A COLLECTION OF CHEMICAL FORMULAS AND PRACTICAL
MANIPULATIONS FOR THE WORKING OF ALL
THE METALS AND ALLOYS, INCLUDING THE DECORATION
AND BEAUTIFYING OF ARTICLES
MANUFACTURED THEREFROM, AS WELL
AS THEIR PRESERVATION.

Edited from Various Sources by

WILLIAM T. BRANNT.
500 Pages, Cloth, \$2.50.

Sent, post-paid, on receipt of price, by
DAVID WILLIAMS, Publisher and Bookseller
96-102 Reade St., New York.

THE CELEBRATED ACID RESISTING DEOXIDIZED BRONZE
IN INGOTS OR CASTINGS, AND
DEOXIDIZED BABBITT METALS.
BEST IN THE WORLD.
Large Castings a Specialty.
Bridgeport Deoxidized Bronze and Metal Co.
BRIDGEPORT, CONN.

MATTHIESSEN & HEGELER ZINC CO.,

LA SALLE, ILLINOIS,

SMELTERS OF SPELTER.

AND MANUFACTURERS OF

SHEET ZINC AND SULPHURIC ACID.

Special Sizes of Zinc out to order. Rolled Battery Plates.

Selected Plates for Etchers' and Lithographers' use.

Selected Sheets for Paper and Card Makers' use.

Stove and Washboard Blanks.

ZINCS FOR LECLANCHE BATTERY.

BRASS GOODS MFG. CO.,

Mfrs. of Stamped Brass, Silver and Nickered Goods, Brass Labels for Cans and Rubber Moulds.

BRONZE DOOR KNOBS

Bronze and Plated Roses, Combined Rose and Escutcheon Plates, Socket Shells, &c., Patent Mirror Pin
Cushion Business Cards, Mucilage Brushes. Novelties of new design made to order.

SALESROOM: 88 Chambers St., New York. FACTORY: 86-92 Third St., So. Brooklyn.

HENDRICKS BROTHERS,

Proprietors of the

Belleville Copper Rolling Mills,

Manufacturers of

Braziers', Bolt and Sheathing

COPPER.

COPPER WIRE AND RIVETS.

Importers and Dealers in

Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.
49 CLIFF ST., NEW YORK.

THE PLUME & ATWOOD MFG. CO.

MANUFACTURERS OF

Sheet and Roll Brass

—AND—

WIRE,

GERMAN SILVER AND GILDING METAL.
COPPER RIVETS AND BURS, COP-
PER ELECTRICAL WIRE,

Pins, Brass Butt Hinges, Jack Chain,
Kerosene Burners, Lamp
Trimmings, &c.

18 MURRAY ST., NEW YORK.

71 PEARL ST., BOSTON.

90 MARKET ST., CHICAGO.

ROLLING MILL,
THOMASTON, CONN.

FACTORIES:
WATERBURY, CONN.

SCOVILL MFG. COMPANY,

Manufacturers of

BRASS

Sheet, Wire, Tubes.

**BUTT HINGES,
BUTTONS,
LAMP GOODS,
NOVELTIES.**

PURE ALUMINUM

INGOT and SHEETS.

FACTORIES, WATERBURY, CONN.

DEPOTS:

438 Broome Street, New York.
210 Lake Street, Chicago.
29 High Street, Boston.

JOHN DAVOL & SONS,

AGENTS FOR

Brooklyn Brass & Copper Co.,

DEALERS IN

**COPPER, TIN, SPELTER,
LEAD, ANTIMONY.**

100 John Street, - - New York.

WILLIAM S. FEARING.

100 Chambers St., NEW YORK,

SELLS TO THE TRADE

*Sheet Brass, Fancy Sheet Brass,
German Silver, Copper, Brass
and German Silver Wire,
Brazed and Seamless Brass and
Copper Tubes, Brass and Cop-
per Rods, Brass Ferrules,
Pure Copper Wire,
Sheet and Ingot Copper, Spelter,
Tin, Antimony, Lead, &c.*

THE TECHNO-CHEMICAL RECEIPT BOOK.

CONTAINING

SEVERAL THOUSAND RECEIPTS, COVERING THE LATEST
MOST IMPORTANT AND MOST USEFUL DISCOVERIES IN
CHEMICAL TECHNOLOGY, AND THEIR PRACTICAL
APPLICATION IN THE ARTS
AND THE INDUSTRIES.

Edited from the German with Additions by

WILLIAM T. BRANNT

495 Pages, Cloth, \$2.00.

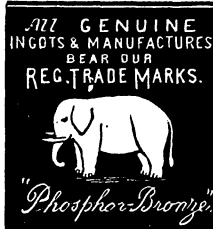
Sent postpaid on receipt of price by

DAVID WILLIAMS, Publisher & Bookseller

96-102 Reade St., New York

Published by DAVID WILLIAMS, 96-102 Reade Street,
New York. Printed by THE WILLIAMS PRINTING
Co., General Book, Commercial and Newspaper
Printers and Binders, Nos. 96-102 Reade St.
New York.

**ELEPHANT
TRADE-MARK.**



PHOSPHOR-BRONZE
INGOTS, CASTINGS, WIRE, SHEET &C.
THE PHOSPHOR BRONZE SMELTING CO. LIMITED
512 ARCH ST. PHILADELPHIA PA. U.S.A.
ORIGINAL MANUFACTURERS OF PHOSPHOR-BRONZE IN THE UNITED STATES AND SOLE MAKERS OF "ELEPHANT BRAND" PHOSPHOR-BRONZE.

**PHOSPHOR
BRONZE.**

Parsons' Manganese Bronze and White Brass.

MADE IN THE UNITED STATES EXCLUSIVELY BY

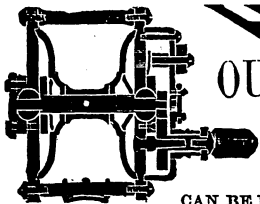
**THE WILLIAM CRAMP & SONS SHIP and ENGINE BUILDING CO.,
PHILADELPHIA, PA.
MANGANESE BRONZE PROPELLERS**

— ARE USED BY THE —

Cunard, Pacific Mail, Hamburg American, White Star, International, Morgan, Canadian Pacific, North German Lloyds and many other Steam Ship Companies, and principal Naval Powers.

Parsons' White Brass; the Most Approved Anti-Friction Metal.

G. DOUGLAS PETRIE, Agent, - Nos. 39 & 41 Cortlandt Street, New York.



HENDRYX
EVERY REEL WARRANTED.
OUTING says of Hendryx patented Adjustable Globe Bearing Aluminum Reels, "perfectly constructed and beautifully finished in every part, these Reels work as truly as watches." Actual weights, Single Action, $2\frac{1}{2}$ ounces; Multiplying, $4\frac{1}{2}$ ounces; Quadruple, $4\frac{1}{2}$ ounces.

THE ANDREW B. HENDRYX CO., NEW HAVEN, CONN., U. S. A.

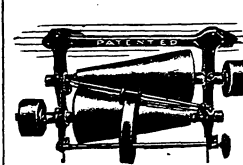
CAN BE PURCHASED FROM ANY FIRST-CLASS DEALERS IN FISHING TACKLE.

**BRASS, BRONZE,
COMPOSITION and F. L. GAYLORD CO. Send
ALUMINUM ANSONIA, for
CASTINGS, Heavy and Light. CONN. Prices.**

Rough Casting of Aluminum.
Aluminum Bronze, German Silver Bronze and all kinds of Metals. Manufacturers of Chandeliers, Metal Picture Frames, Ink Stands, Figures, Statues, etc. Stair Carpet Holders a Specialty.

**St. Louis Bronze & Aluminum Works,
3741-3743 North Broadway,
ST. LOUIS, MO.**

EVANS FRICTION CONES.



For regulating the speed of machines automatically or by hand. Thousands of sets in operation driving all kinds of machinery which require from 1 to 50 H.P. Address
**Evans Friction Cone Co.,
85 Water Street,
Boston, Mass.**

**THE CRESCENT TRY IT!
AND YOU WILL USE NO OTHER**
**THE CRESCENT BRAND
PHOSPHOR
TIN.**
THE HIGHEST AND
RICHEST GRADE MADE.
MANUFACTURED ONLY BY
THE CRESCENT PHOSPHORIZED METAL CO
OFFICE AND WORKS
2107 2109 and 2111 INDIANA AV. PHILADELPHIA, PA.

CROWN SMELTING COMPANY,
Chester, Pa.
Bronze, Brass and Composition Castings.

Inventors and Sole Manufacturers of

"Crown Bronze" Bearing Metal and "Crown ROLLING MILL Babbitt Metal."

Manufacturers of PHOSPHOR-BRONZE TO PENNSYLVANIA RAILROAD.

Specifications in Ingot metal or castings.

The W. W. & R. M. KEYS CO.,

Bronze,
Composition
and
Brass
Castings
of all kinds,
also
Babbitt
Metals.

BRIDGEPORT, CONN.

PHOSPHOR-TIN
BY USING MY PHOSPHOR TIN MANUFACTURERS CAN MAKE ANY DESIRED GRADE PHOSPHOR BRONZE THEMSELVES. BY THE SIMPLE PROCESS OF MELTING. MUCH CHEAPER THAN THEY ARE NOW TO BE HAD IN THE MARKET. NEW OR OLD COPPER CAN BE USED. FOR CIRCULARS AND PRICES ADDRESS **HALK & NAUMANN** NEW YORK OFFICE
SOLE AGENTS FOR THE U.S. AND CANADA, 3 PEARL

The American Metal Co.

(LIMITED),

Levin Building, 80 Wall St., New York.

P. O. BOX 957.

COPPER, COPPER ORES AND MATTES.
TIN, LEAD, SPELTER, ANTIMONY, NICKEL,
ALUMINUM, BULLION, IRON.

Advances made on Consignments.

AGENTS FOR

Henry R. Merton & Co., - London.
Metallgesellschaft, Frankfort-on-Main.
Williams, Foster & Co. Ltd., Swansea.

BEST, FOX & CO.,
25th Street and A. V. Ry. - PITTSBURG, PA.

SOLE MANUFACTURERS OF

CLIMAX BRONZE

FOR ALL PURPOSES.

CASTINGS from 1 oz. to 12,000 lbs.

A

WASHBURN & MOEN MANUFACTURING CO.,

WORKS IN WORCESTER, MASS., and WAUKEGAN, ILL.

MAKERS OF IRON, STEEL AND COPPER

EVERY VARIETY OF **W I R E** FOR ALL PURPOSES.

FINE OIL TEMPERED SPRINGS A SPECIALTY.

SPIRAL 

FURNITURE,

BED AND

SPECIAL

SPRINGS.

**FLAT**

CLOCK

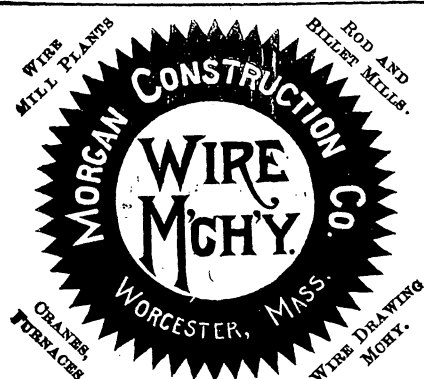
and

WATCH

SPRINGS.

EXPORT ORDERS PROMPTLY FILLED.

Warehouses: 16 Cliff and 241 Pearl Sts., New York; 107 & 109 Lake St., Chicago; 8 & 10 Pine St., San Francisco.

**WM. MCFARLAND,**

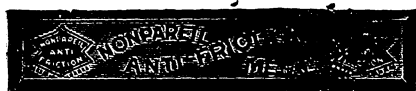
IRON FOUNDER,

TRENTON, - - N. J.

Chilled Cast Wire DIES

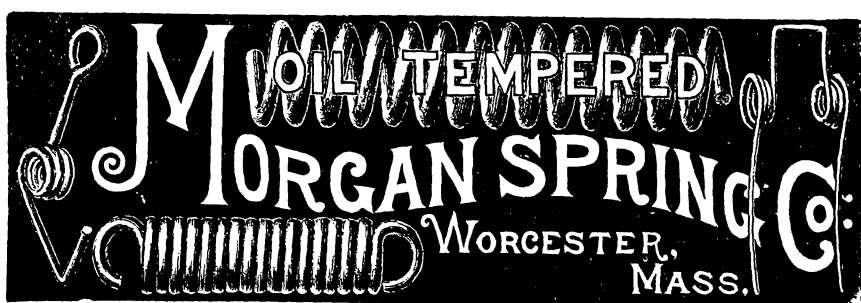
A SPECIALTY.

Any Size or Style Made at Short Notice.



Guaranteed.

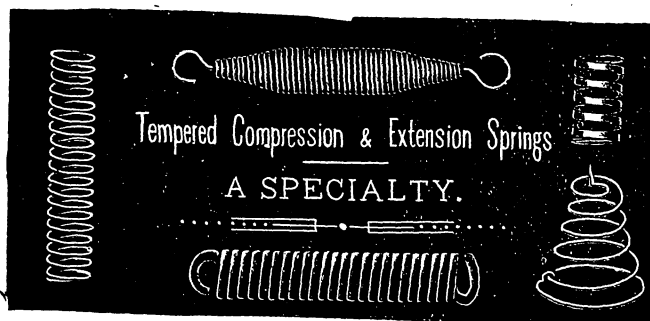
Best Anti-Friction Metal for all machinery bearings. For high speed and heavy crushing weight it has no equal. Introduced in this country since 1891 and has displaced all Anti-Friction metals it has come in contact with.

THEODORE HIERTZ & SON, SOLE MFRS.
Manufacturers Babbitt Metals, Solder, Lead Seals,
Electrotype and Stereotype Metal.
30th St. & Park Ave., St. Louis, Mo.**MILLER & VAN WINKLE,**

MANUFACTURERS OF

STEEL WIRE AND STEEL SPRINGS.

TEMPERED STEEL WIRE.



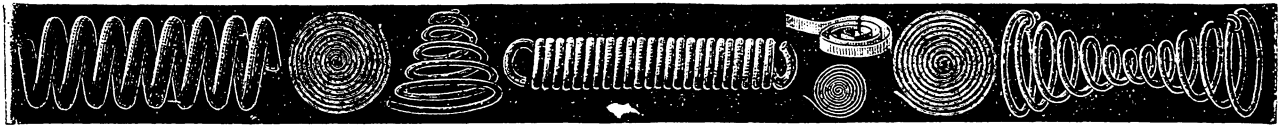
MACHINERY SPRINGS.

OFFICE AND WORKS: }
18 to 24 Bridge Street, } BROOKLYN, N. Y.VOLUTE,
WIRE
and
FLAT STEEL**SPRINGS**of Agricultural Implements, Machinery and various other purposes.
Write for prices to
SABIN MACHINE CO.,
MANUFACTURERS.
MONTPELIER, VT.



117th to 118th Street and Harlem River.

General Offices, Foot 118th Street, New York.



Makers of Iron, Bessemer, Siemens-Martin and Crucible Cast Steel Wire of all kinds, annealed, soft and hard drawn; Coppered Spring Wire for Furniture Springs, &c., Coppered Soft Wires, Baling Wires, Suspension Bridge and Rope Wires of all kinds, &c.

STEEL MUSIC WIRES and MUSIC SPRING WIRES,

UNRIVALED FOR PIANOFORTE STRINGS.

FOR THE HIGHEST CLASS OF SPRINGS.

Specialty of finest Cast Steel Wires, round, flat, square and any other shape, tempered and also in the soft state, guaranteed to harden and temper. Solid Rib and Paragon Umbrella Wires. Crinoline, Corset, Shade Roller, Lock, Hat, Brush, Saw, Band Saw, Clock Spring, Clock Bell, Clock Verge and Watch Spring, Rule and Tape Line and Eyeglass Wires, &c. Piano, Needle, Fish Hook, Drill and Hair Spring Wires. Special Cast Steel Wires of any kind made for special purposes. Also Covered Wires—Braided and Cloth and Paper Covered—for crinoline, corset and other purposes. Cold Rolled and Slit soft and Tempered Steel Strips of all kinds and for all purposes.

Special Wires and Springs of Every Description.

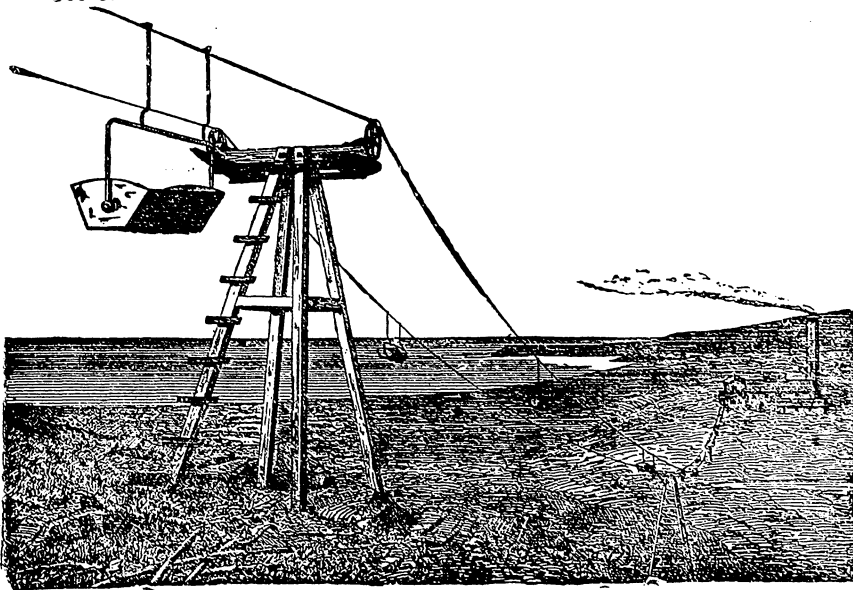
CORRESPONDENCE SOLICITED.

SAMPLES FURNISHED ON APPLICATION.

CALIFORNIA WIRE WORKS,

509-511 MARKET STREET,

SAN FRANCISCO, CAL.



MANUFACTURERS OF

WIRE ROPE FOR CABLE RAILWAYS AND MINING PURPOSES
HALLIDIE'S PATENT WIRE ROPEWAY,

Simplest and most economical means of transportation.

Send for illustrated Catalogue.

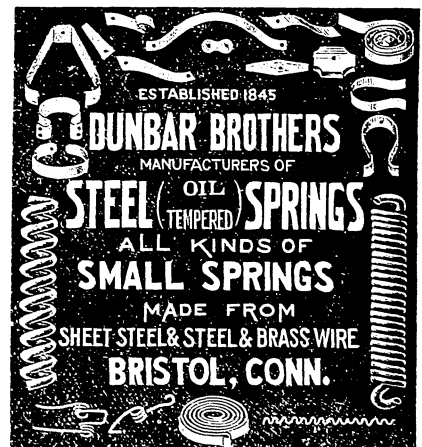
THE CELEBRATED

"SILVER FINISH"

GALVANIZED POULTRY NETTINGS.

FOR SALE BY THE HARDWARE TRADE.

GET THE BEST.



GEO. W. PRENTISS & CO.
HOLYOKE, MASS.,

—MANUFACTURERS OF—

WIRE. WIRE.



Bright, Coppered, Annealed and Tin Plated.
Finished to order, round, square, oval or flat.

FINNED WIRE OF ALL SIZES A SPECIALTY

Always
Ask
For



Unequaled for Strength
and Durability.

Made Only by

Broderick & Bascom Rope Co.,
St. Louis, Mo.

HOWSON
AND
HOWSON

Counsellors at Law
Solicitors of Patents

PHILADELPHIA
Forrest Building, 119 S. 4th St.
NEW YORK
Potter Building, 38 Park Row.
WASHINGTON
Atlantic Building, 928 F St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. Twenty
Years' Experience. Send model or sketch
and brief description of your invention for
Free report as to patentability. Expert
searches and opinions as to Scope, Valid-
ity and Infringement. Patent Causes
Prosecuted and Defended. Practice in
U. S. Supreme, Circuit and Circuit Ap-
peals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents." Free.

PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.
E. B. STOCKING, Attorney at Law,
611 F ST., N. W., WASHINGTON, D. C.

PATENTS.

H. W. T. JENNER, Patent Attorney and Me-
chanical Expert. 519 Seventh St., Washington;
D.C. Charges moderate. Write for terms.
Established 1883.

SPRINGS—RIVETS.

Specialties in

SHEET METAL WORK,
CLOCK and INDICATOR POINTERS,
CLARK & COWLES, Plainville, Ct.

W. S. ESTEY,

No. 65 FULTON ST., NEW YORK,

MANUFACTURER OF

WIRE CLOTH

Of Brass, Copper, Iron, Galvanized and Steel Wire of
all meshes and grades. For Mining, Milling and all
other purposes. Locomotive Spark Wire Cloth,
&c.,

—AND—

WIRE WORK

For Bank, Office and Counter Railing, Store Fronts
Window Guards, &c.

Galvanized Twist Netting.

Oliver's Patent Decoy Rat Traps.

S T Pat. Adjustable Foundry Riddles.

S T Sand Screens.
SEND FOR CATALOGUE.

COBB & DREW,

PLYMOUTH, MASS.

Manufacturers of Norway Iron Rivets, Brass
and Copper Rivets, Burrs, Washers,
D. P. Tacks and Staples.

New York Agency, James S. Hender-
son, successor to Disosway &
Henderson, Hardware.

Agents for Philadelphia Star Carriage
and Tire Bolts.

A. LESCHEN & SONS' ROPE CO.,

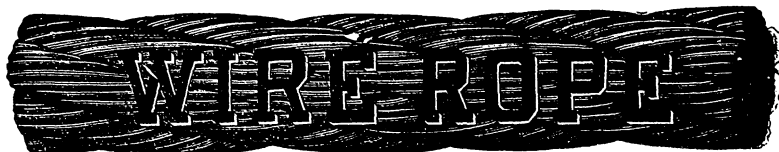
MANUFACTURERS OF

Trade-Mark



Registered.

ST. LOUIS, MO. CORRESPONDENCE INVITED.



Williamsport Wire Rope Co., Williamsport, Pa.



WAREHOUSES: 87 Liberty St., New York. WORKS
Wilkesbarre, Pa.

NEW HAVEN WIRE MFG. CO.,

Manufacturers of

WIRE

in great variety.

NEW HAVEN,

CONN.

Wire Cloth AND Wire Goods

Hardware Grade and
Fanning Mill Wire Cloth,
Poultry Netting, Heavy
Window Screen Wire
Cloth, Coal and Sand
Screens, Riddles, Ash
Sieves, &c., &c.



Office and Counter
Railings, Elevator En-
losures, Wire Stall
Guards, Hay Racks
Feed Boxes, Window
Guards, &c., &c.

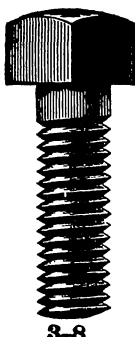
BUFFALO, N. Y.

REYNOLDS & CO.,

MANUFACTURERS OF

SET, CAP AND MACHINE SCREWS,

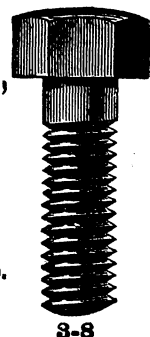
STUDS, COUPLING BOLTS, STOVE BOLTS, FINISHED NUTS, &c.



3-8



5-16



3-8

Also Hand and Draw-Plate Moulding Machines for Foundry Use.

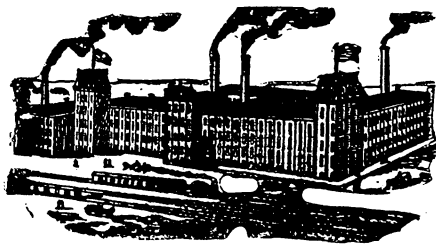
NEW HAVEN, CONN.

Send for Catalogue.

HOWARD & MORSE
 45 FULTON ST,
 NEW YORK.
 HEAVY MINING
 COPPER,
 BRASS,
 STEEL
 OR IRON
 WIRE CLOTH.

ALSO
 MANUFACTURERS OF
 GENERAL
 WIRE WORK.
 Window Guards,
 Stable Fixtures,
 RAILINGS,
 Sand Screens
 Coal Screens
 Etc.

WICKWIRE BROTHERS, CORTLAND, N. Y.
 MANUFACTURERS OF
 Wire Cloth and Wire Goods,



Coal Sieves,
 Flour Sieves,
 Corn Poppers,
 Dish Covers,
 Metallic
 Coal Sieves.

NEW PROCESS
Cortland
 POWER LOOM
 WIRE CLOTH.

Every roll wrapped in Pink Paper
 and has our name on label.

Kilmer Manufacturing Co.

—Newburgh, N. Y.

Manufacturers of

BALE TIES

For Baling
 Hay, Straw,
 Rags,
 Excelsior, &c.

ALSO WIRE RODS, BARB WIRE, COILED STEEL WIRE, WIRE STAPLES, GALVANIZED WIRE, ORNAMENTAL FENCING, &c., &c.

Western Warehouse 543 and 545 State Street, Chicago, Ill.
 Western Office 21 Quincy Street, Chicago, Ill.
 New York Office, 111 Water Street, New York City.
 Works and General Office, Newburgh, N. Y.

Metal Work
 For Interior
 And Exterior
 Decoration
 A Specialty.
 Send for
 Catalogue.

Yellow-Saylor Wire Co St Louis.

THE VAN DORN IRON WORKS CO., Cleveland, Ohio.



Office and Salesroom, 157 1/2 Euclid Ave.,
 MANUFACTURERS OF
WROUGHT IRON FENCE AND RAILING.
 Stable Fixtures, Crestings, Terminals, Wire Office and
 Counter Railing, Lawn Seats and Vases.
 Iron and Steel Jail Cell Work. Orna-
 mental and Structural Ironwork.

PERFORATED SHEET METALS

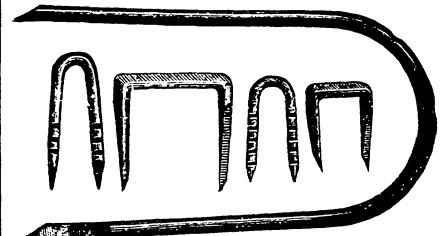
OF EVERY DESCRIPTION.



THE HENDRICK MFG. CO., LTD.
 CARBONDALE, PA.

E. H. Titchener & Co.,
 BINGHAMTON, N. Y.

—MANUFACTURERS OF—



STAPLES in All Varieties,
 Double-Pointed Tacks, Bed Links, Etc.
Blind Staples a Specialty!

**BARBED WIRE,
 PLAIN WIRE
 AND WIRE NAILS.**

Quick Shipment. Write for Prices.

Indiana Wire Fence Co.,
 Crawfordsville, Ind.



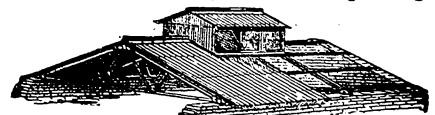
**CHAMPION
 IRON CO.**

SPECIALTIES. — Iron
 Stairs and Jail Work, Build-
 ers' and Ornamental Iron
 Work, and the only manufacturers of Malleable
 Iron Casting guaranteed against breakage; also
 manufacturers of the Celebrated
 Ohio Champion Iron Force and
 Lift Pumps. Send for 220-page
 Catalogue

Largest Iron Fence and
 Railing Works in U. S.

KENTON, O.

Corrugated, Crimped and Clap-Board Iron Roofing & Siding.



Iron Buildings, Roofs, Doors, Shutters, Cornices
 Skylights, Bridges, &c.

MOSELEY IRON BRIDGE AND ROOF CO.,
 Office 5 Dey Street, Room 13 NEW YORK.



Reliance Wire & Iron Works, MILWAUKEE, WIS.

ARCHITECTURAL WIRE AND IRON WORKERS.

Wire Cloth, Galvanized Fencing and Netting, Wire Lath, Wire and Iron Fences and Railings, Window Guards, Stable Fixtures, Bank and Office Railings, all kinds of Brass, Wire and Iron Work for Buildings and Offices.

SEND FOR ILLUSTRATED CATALOGUE.



CLINTON WIRE CLOTH CO.,

— Manufacturers of Every Description of —

WIRE CLOTH, HEX. NETTINGS, WIRE LATH AND FENCING.

Perforated Metals. GALVANIZERS AND TINNERS OF Wire Cloth and Nettings.

Clinton "Standard" (Number 33 Wire) Painted Window Screen Wire Cloth.

FACTORY AND GENERAL OFFICE: CLINTON, MASS.

NEW YORK, 76 Beekman Street.

BOSTON, 199 Washington Street.

CHICAGO, 137 Lake Street

The Gilbert & Bennett Mfg. Co.

— MANUFACTURE —

Pearl Window Screen Wire Cloth.
Galvanized Steel Wire Cloth.
Galvanized Wire Poultry Netting.
"Cottage" Lawn & Garden Fencing.
The World's Web Wire Fencing.
Sieves, Riddles, Screens.
Gilbert's Rival Ash Sifters.
House Furnishing Wire Goods.

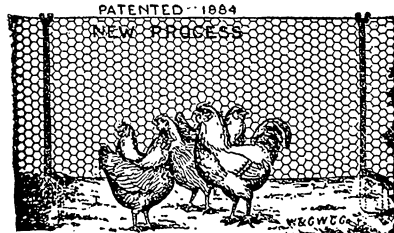
WIRE CLOTH, NETTING, Wire Goods, Wire Work

RAILINGS, WINDOW GUARDS.
WIRE LATHING WITH HAMMOND'S METAL FURRING.

44 Cliff Street,
NEW YORK.
148 Lake Street,
CHICAGO.

Factories, { GEORGETOWN, CONN.
CHICAGO, ILLINOIS.
ESTABLISHED 1818.

WRIGHT & COLTON WIRE CLOTH CO., Worcester, Mass.



HARD STEEL WIRE

NEW PROCESS
HARD STEEL WIRE CLOTH AND NETTING
GALVANIZED
WIRE NETTING.

Patented March, 1884.
Patents Pending.

Painted Window Screen Wire Cloth,

WIRE LATHING, HOUSE FURNISHING WIRE GOODS

SEND FOR LATEST CATALOGUE.

PENNSYLVANIA WIRE WORKS,

EDWARD DARBY & SONS, 233-235 Arch St., Phila., Pa.,

MANUFACTURERS.

BRASS, COPPER, STEEL, IRON and GALV'D WIRE CLOTH.

Pennsylvania Galv'd Poultry Netting,
Sieves, Riddles, Wire Window Guards,
Wire and Iron Goods.

Cortland Painted Window Screen Wire
Cloth, Coal and Sand Screen, Wrought
Iron Work of Every Description.

CORRESPONDENCE SOLICITED.

PAINTED AND GALVANIZED WINDOW SCREEN CLOTH.

IRON, STEEL, BRASS AND COPPER WIRE CLOTH.

MANUFACTURERS
**THE ROEBLING
STANDARD
WIRE
LATHING.**

• NEW JERSEY • WIRE CLOTH CO.

**"JERSEY"
POULTRY
NETTING
AND FARM
FENCING.**

TRENTON, 117 and 119 LIBERTY STREET,
NEW JERSEY.

NEW YORK.

171 and 173 LAKE STREET,
CHICAGO.

25 and 27 FREMONT STREET,
SAN FRANCISCO.

THE BERLIN IRON BRIDGE Co.,

OFFICE AND WORKS,

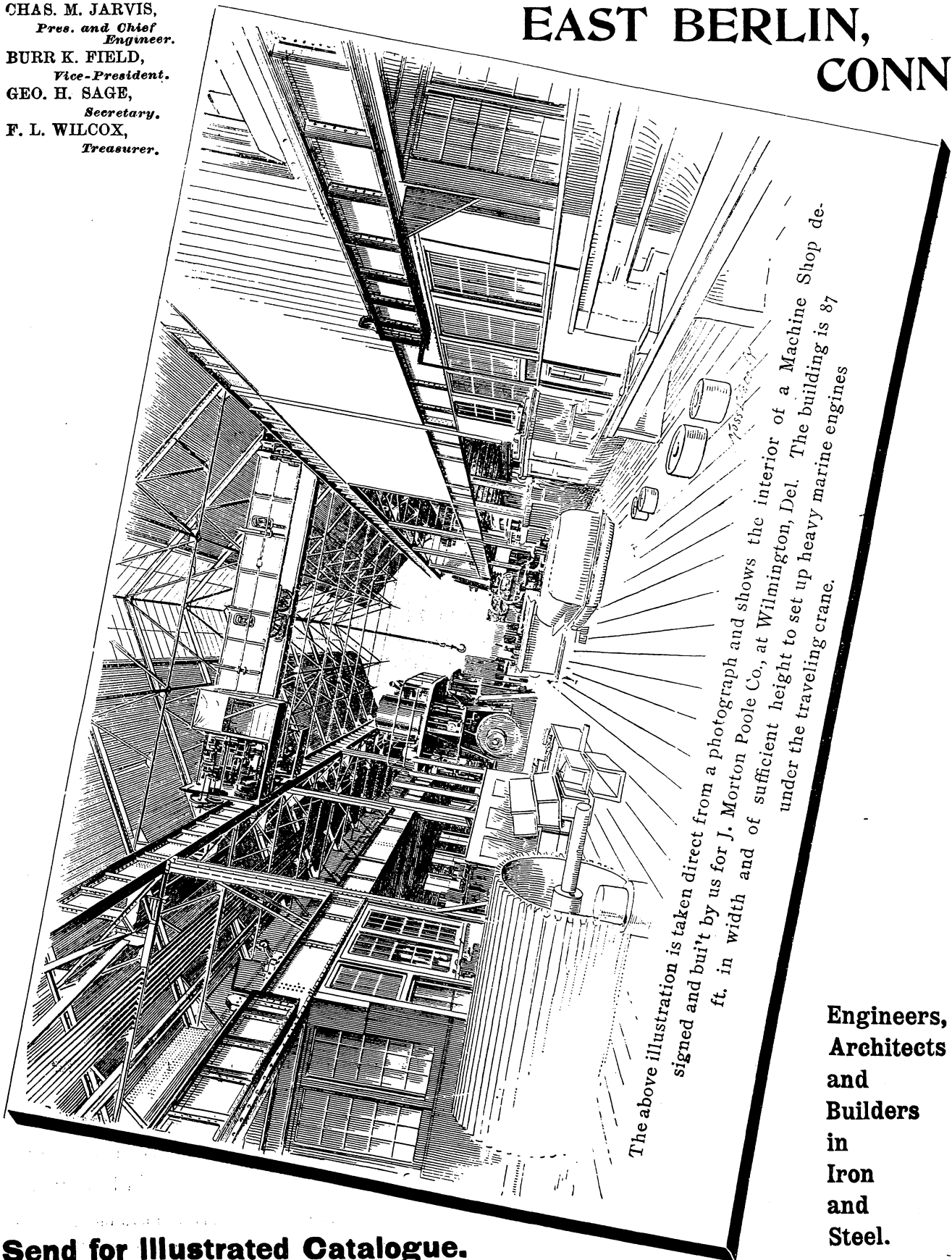
EAST BERLIN,
CONN.

CHAS. M. JARVIS,
Pres. and Chief Engineer.

BURR K. FIELD,
Vice-President.

GEO. H. SAGE,
Secretary.

F. L. WILCOX,
Treasurer.



The above illustration is taken direct from a photograph and shows the interior of a Machine Shop designed and built by us for J. Morton Poole Co., at Wilmington, Del. The building is 87 ft. in width and of sufficient height to set up heavy marine engines under the traveling crane.

**Engineers,
Architects
and
Builders
in
Iron
and
Steel.**

Send for Illustrated Catalogue.

ATLAS TACK CORPORATION.**508 SEARS BUILDING, BOSTON, MASS., U. S. A.**

BRANCHES: { **DUNBAR, HOBART & CO., WHITMAN, MASS.**
ESTABLISHED IN 1810.
A. FIELD & SONS, TAUNTON, MASS.
ESTABLISHED IN 1827.
AMERICAN TACK CO., FAIRHAVEN, MASS.
ESTABLISHED IN 1867.

LORING & PARKS, PLYMOUTH, MASS.
ESTABLISHED IN 1845.
TAUNTON TACK CO., TAUNTON, MASS.
ESTABLISHED IN 1854.
OLD COLONY RIVET CO., PLYMOUTH, MASS.
ESTABLISHED IN 1866.

MANUFACTURERS OF

Tacks, Brads, Small Nails, Shoe Nails, Lining and Saddle Nails, Tufting Nails and Buttons, Wire Nails, Finishing Nails, Patent Brads, Hungarian Nails, Steel Shanks for Boots and Shoes, Wire Tacks, Escutcheon Pins, Eyelets, Glaziers' Points, Rivets, Burrs, Furniture Springs, Pilgrim Spring Bed, and other articles.

We have the largest and only complete and fully assorted stock in the world. Our manufacturing facilities are unequalled. The foregoing well known brands we continue to use, and either will be furnished upon request. We have long distance telephone connection with our New York store and our factories.

MAIN OFFICE, 508 SEARS BUILDING, 199 WASHINGTON ST., BOSTON, MASS.

BRANCH OFFICE & WAREHOUSE, 31 WARREN ST., NEW YORK.

BRANCH OFFICE & WAREHOUSE, 239 & 241 LAKE ST., CHICAGO, ILL.

BRANCH OFFICE & WAREHOUSE, 408 MARKET ST., SAN FRANCISCO, CAL.

BRANCH OFFICE & WAREHOUSE, 406 COMMERCE ST., PHILADELPHIA, PA.

Tacks, Wire Nails and Brads, Hoop Nails, Staples, Silver and Japanned Lining and Saddle Nails, Double Pointed Tacks, Slating and Roofing Nails.

BONNIE BLUE TACKS.
100 Kegs in a Box,
Assorted 3 to 12 oz.
Retail 2 Kegs for 5 cents.

PARISIAN GILT NAILS.
20 papers in Carton.
5 cent seller.

MONARCH WOOD KEG CARPET TACKS.
5 cent seller.

"JUST ENOUGH"
Brass Nails. 100
Nails in a Paper, just
enough to top a pair
of shoes; 20 papers in
Carton. 5 cent seller.

DOUBLE ENOUGH
Cobblers' Nails. 200
Nails in a Paper, 20
Papers in Carton. 5
cent seller.

BILL NYE BRAD BOX.

168 Papers Wire Brads, assorted $\frac{1}{2}$ to 2 in
Each Paper just right to retail for 5 cents.

QUARTER SIZE CUT OF



GRAND CROSSING, CHICAGO, ILL. U.S.A.

GOODWIN'S**Improved Book-keeping and Business Manual,**

Revised and Enlarged Edition.

BY J. H. GOODWIN.

Forty-first Thousand.

The author of this book has sought among bookkeepers of all degrees of ability and business men in various kinds of business for points which would be likely to prove of value either to a bookkeeper or to a business man. In these interviews he has been permitted to inspect the books of some of the largest business houses of the country, and to learn the methods employed by them. The work therefore embodies not only the results of his own experience, but that of at least a hundred other bookkeepers of the highest standing in the profession, from whom there have been received and are here given a *great variety of valuable points.*

A FEW OF THE IMPORTANT MATTERS CONSIDERED ARE AS FOLLOWS:

ADVANCED DOUBLE ENTRY. Describing the peculiarities of the most advanced systems of the present day, and contrasting them with those of antiquated systems. In this article it is shown how a set of books may be kept by Double Entry with an increase in labor of *only three per cent.* beyond that required for the keeping of them by Single Entry. The principles of Single Entry are described, and the objections to that method of keeping books set forth. Complete directions are given for the changing of a set of books from Single Entry to the most advanced system of Double Entry.

PERPETUAL PROOF. A new method of proving each and every posting, as well as the balance of every account in the Ledger—requiring but little, if any, additional labor, and effecting a saving of *fifty per cent.* in the expense of both Salaries and Ledgers.

NO TEACHER REQUIRED. Many hundreds of purchasers who had no previous knowledge of bookkeeping

have secured excellent situations through the knowledge derived from a study of this work.

STOCK COMPANIES. Explaining at length how the books for such are opened and closed; also describing in detail many other peculiarities appertaining especially to this class of business concerns.

"A I" HOUSES. This article was written principally, from points given to the author by nineteen of the largest houses in New York City.

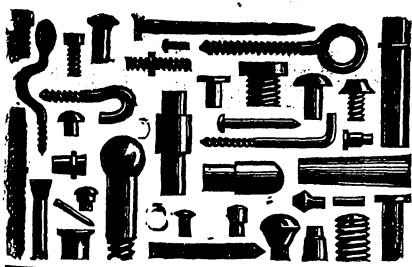
TRIAL BALANCES. A recently discovered method of detecting errors in Trial Balances, also a new method of detecting errors in posting.

BUSINESS MEN. This work contains a large number of valuable hints upon subjects of special interest to all business men.

Printed in two colors, on an excellent quality of paper, and is substantially bound in dark, rich cloth. Sent, post-paid, on receipt of price (\$3.00) by

DAVID WILLIAMS, PUBLISHER AND BOOKSELLER,

96-102 READE STREET, NEW YORK.



IRON AND BRASS RIVETS,

STUDS, PINS, SCREWS, &c.,

For Manufacturers of Light Hardware.

BLAKE & JOHNSON, WATERBURY, CONN.

NEW CASTLE WIRE NAIL CO.,

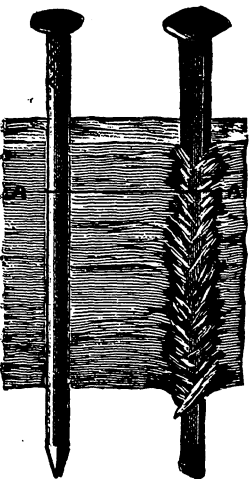
MANUFACTURERS OF



WIRE RODS AND WIRE.

Office and Works,

NEW CASTLE, PA.



THE SALEM WIRE NAIL CO.

MANUFACTURERS

WIRE NAILS,

Works: SALEM, O.; FINDLAY, O.

General Office: - SALEM, OHIO.

BRANCH OFFICES:

Room 28, 277 Broadway, New York.

415 Phenix Bldg., Chicago.

200 Amer. Central Bld'g, St. Louis.

19-20 Ainsworth Block, Portland, Ore.

38 Pickering Bld'g, Cincinnati, O.

OXFORD

IRON AND NAIL CO.,

Cut Nails

AND

SPIKES.

J. S. SCRANTON, Sales Agent,

81, 83 and 85 Washington Street,

NEW YORK.

PHILLIPS, TOWNSEND & CO.,

North Penn Junction, Philadelphia.

WIRE NAILS, - - -

- - NORWAY RIVETS.

Rivets marked "P" are not of our make. We make only first-class NORWAY IRON RIVETS

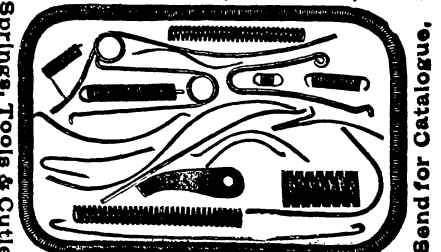
BORDEN & LOVELL,

70 AND 71 WEST STREET.

NEW YORK.

Steel, Iron and Wire Nails.

TUCK M'F'G CO., Brockton, Mass



Tempered Springs of all kinds.

Pocket Companion. Containing useful information and tables appertaining to the use of wrought iron and steel as manufactured by Carnegie, Phipps & Co., Ltd., Pittsburgh, Pa. For engineers, architects and builders. 1892 edition. Edited by C. L. STROBEL, C.E., assisted by F. H. KINDL, C.E. Leather with flap, 334 pages.....\$2.00

For Sale by DAVID WILLIAMS, 96-102 Reade St., N. Y.

We are prepared to make

400

Soldering Coppers

PER DAY.

Quality and Finish Unexcelled.

Correspondence with the trade requiring special patterns respectfully solicited.

CLENDENIN BROS., Baltimore, Md.

ROOF CRESTING.

ILLUSTRATED CATALOGUE FREE.

Iron Columns, Stairs, Fire Escapes, Grilles, Window Guards, Wire Signs.

HIGHEST AWARDS RECEIVED AT WORLD'S FAIR ON

BANK and OFFICE RAILING, WIRE and IRON FENCES, LAWN VASES

JAIL CELLS, CHEESE SAFES.

E. T. BARNUM,

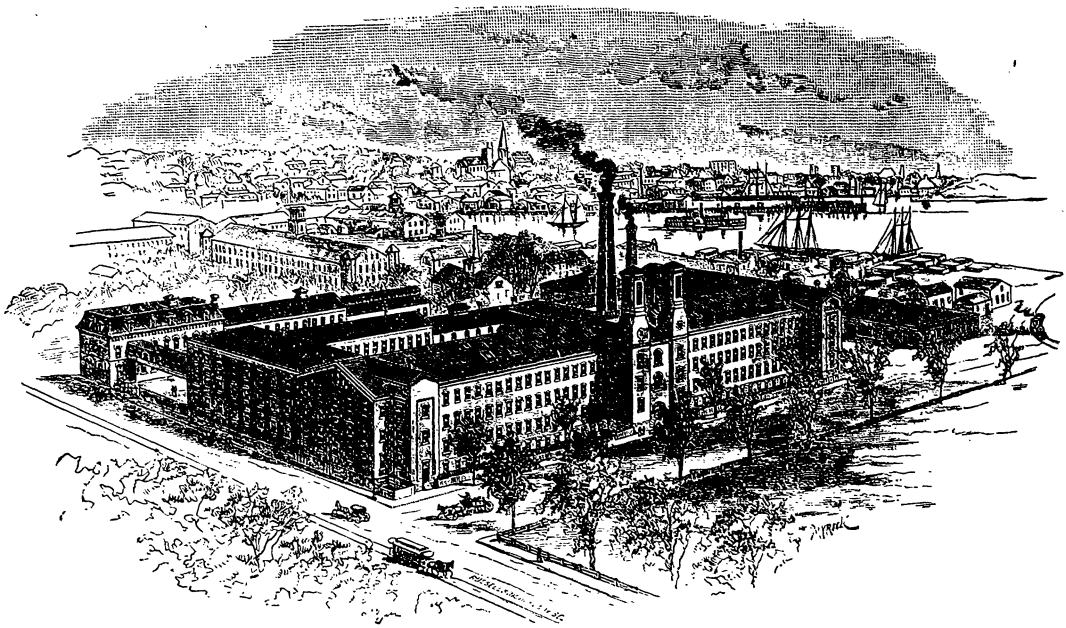
Detroit, Mich.



ROOF CRESTING.

American Screw Company,

PROVIDENCE, R. I.



NEW ENGLAND MILL, PROVIDENCE, RHODE ISLAND, U. S. A.

MANUFACTURERS OF

WOOD SCREWS,

In Iron, Brass, Bronze and all Varieties
of Finish.

COACH SCREWS,
MACHINE SCREWS,
RAILROAD SCREWS,
HAND RAIL SCREWS,
SIDE KNOB SCREWS,
LOCK CAP SCREWS,
DOWEL SCREWS,
CHANDELIER SCREWS,
RIVETS, BURS,

TIRE BOLTS,

STOVE BOLTS,
SLEIGH SHOE BOLTS,
SINK BOLTS,
STOVE RODS,
POINTED WIRES,
TAPPED NUTS,
WIRE NAILS,
DOWEL PINS,
TAPS FOR MACHINE SCREWS,
TAPS FOR STOVE BOLTS.

**GOLD
FORGED**

Rogers Drive Screws,
Side Knob Screws,
Lock Cap Screws,
Machine Screws,
Stove Bolts,
Forged Wood Screws,
Threaded Wires,
Fluted Tire Bolts.

American Screw Company,

PROVIDENCE, R. I.

Chicago Store. No. 19 Lake St.

EUROPEAN AGENTS, THOMAS & STIRLING, Liverpool.

Perforated Filter
Press Plates.



PERFORATORS OF STEEL, IRON, COPPER, ZINC, BRASS AND TIN.

GRAIN CLEANING AND MINING MACHINERY,
WOOLEN, COTTON, PAPER AND PULP MILLS,
RICE, FLOUR AND COTTON SEED OIL MILLS,
SUGAR AND MALT HOUSES,
DISTILLERIES, FILTER PRESSES,

FOR USE IN

STONE, COAL AND ORE SCREENS,
BRICK AND TILE WORKS, FILTERS,
SPARK ARRESTERS, GAS AND WATER WORKS,
OIL, GAS AND VAPOR STOVES,
COFFEE MACHINERY, ETC., ETC.

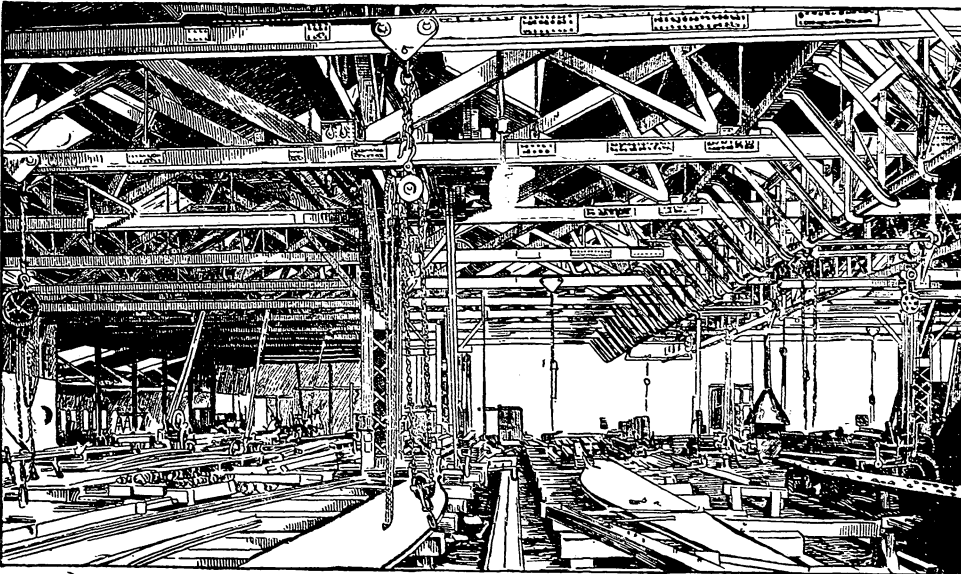
STANDARD SIZES PERFORATED TIN AND BRASS ALWAYS IN STOCK.

Main Office and Works, 222 to 240 N. Union St., Chicago, Ill., U. S. A. Eastern Office, No. 284 Pearl St., New York.

WROUGHT IRON BRIDGE CO.

CANTON, OHIO.
NEW YORK CITY.
CHICAGO, ILL.
KANSAS CITY, MO

COMMUNICATE WITH NEAREST OFFICE.



Iron Buildings, Roofs and
General Structural Work
in Iron and Steel, Ma-
chine Shops, Foun-
dries, Power
Houses, &c.

The above is a cut of our new works. The main building is 256 feet square and is fitted with improved machinery for handling all classes of Bridge and Structural work. All machinery is operated by electricity from our own plant.

— **EASTERN FORGE CO.,** —

Medium
and
Heavy

FORGINGS

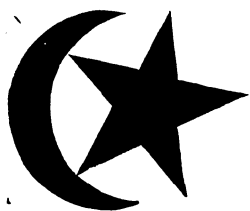
OF

Iron
or
Steel.

Forged only ;—Rough Machined ;—or Completely Finished. Latest and best facilities for quick and economical production.

Machine Bolts, Nuts, Washers Plain Rods, Upset Rods. Special Bolts and Nuts.

General Offices, Rooms 78-80 Mason Building, Boston, Mass.



P. P. EMORY MFG. CO.

—: ESTABLISHED 1850. :—

SPRINGFIELD, MASS.

COPPERSMITHS,

AND MANUFACTURERS OF

COPPER AIR

CHAMBERS,

EXPANSION PIPES

AND COILS.

BRASS AND COMPOSITION

HEAVY AND LIGHT

CASTINGS

TO ORDER.

SEND FOR PRICES.

The Leading Authority on
Business Law.

PARSONS' THE LAWS OF BUSINESS,

For all the States and Territories of
the Union.

By Theophilus Parsons, LL.D.

864 pages, 6 x 9 inches; full leather\$4.50

This is a work almost indispensable to every business man, as a guide in transactions which are occurring constantly.

It constitutes a library of law on daily business affairs and is used for constant reference by many of the leading concerns throughout the country.

The volume treats fully and clearly of contracts, sales, agency, agreements and assessments, stoppage and transitu, considerations, limitations, notes and bills of exchange, interest and usury. Embraces chapters on commercial law in general, bonds, assignments, guaranty, the statute of frauds, receipts and releases, payment, partnership, arbitration, carriage of goods and passengers by railroad and other carriers hotel keepers, patents, copyrights, statute of limitations, the law of place, shipping, marine, fire and life insurance, deeds of land, mortgages of land, mortgages of personal property, leases, liens of mechanics and material men, the recovery of debts, wills, executors and administrators, guardians, and the legal rights of farmers, &c. Also abstracts of the laws of all the States and Territories relating to the collection of debts, usury, the execution and acknowledgment of deeds, witness required to wills, holidays and days of grace, mechanics' liens, chattel mortgages, and nearly 300 approved forms which have been tested in courts.

Sent prepaid on receipt of price by

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 READE ST., NEW YORK.

Gautier Steel Department of Cambria Iron Co.,

JOHNSTOWN, PA.

—: MANUFACTURERS OF:—

MERCHANT BAR STEEL:

Including Tire, Toe Calk, Machinery, Carriage Spring, Railroad Spring, Hoe, Rake, Fork, etc.

AGRICULTURAL STEEL AND SHAPES:

Finger Bars, Knife Backs, Rake Teeth, Bundle Carrier Teeth, Tedder Forks and Springs, Spring Harrow Teeth, Harrow (Drag) Teeth, Seat Springs, etc.

PLOW STEEL:

Flat and Finished Plow Shapes, Digger Blades, Slabs, (Penn and Pernot), Hammered Lay, Rolled Lay, etc.

COLD ROLLED STEEL SHAFTING.

STEEL HARROW DISCS.

CAMBRIA LINK BARB WIRE.

New York Office,
102 Chambers St.

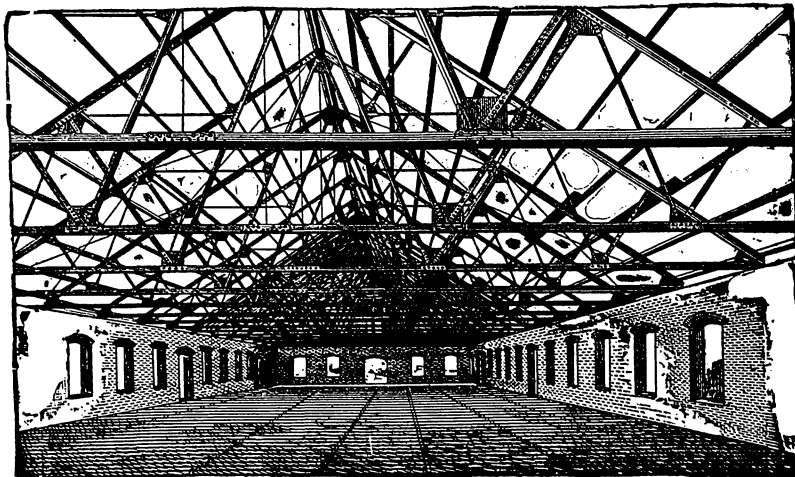
Philadelphia Office,
S. W. Cor. 5th & Commerce Sts.

Chicago Office,
209 Phenix Building.

Southern Office,
Chattanooga, Tenn.

IRON AND STEEL BRIDGES, ROOFS AND BUILDINGS BOSTON BRIDGE WORKS,

Engineers and Builders,
MASON BUILDING, BOSTON, MASS.

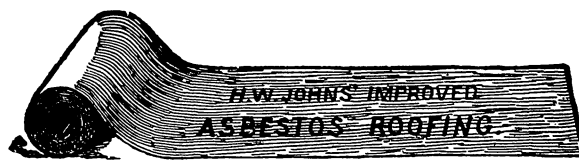


Roof of Machine Shop at Portsmouth (N. H.) Navy Yard.

INQUIRIES SOLICITED.

D. H. ANDREWS, Prop'r.
J. R. WORCESTER, Chief Eng'r.

A. S. MILLER, Jr., Sec'y.
R. H. BROWN, Con. Eng'r.



IMPROVEMENTS PATENTED 1890 IN THE U. S., CANADA AND EUROPE.

FIRE-PROOF. Easily applied by anyone. Send for Samples and Descriptive Price List.

H. W. JOHNS MANUFACTURING COMPANY,

H. W. Johns' Asbestos Fire and Water-Proof Sheathing, Building Felt, Steam Packings, Boiler Coverings, Liquid Paints, Roof Paints, Roof Cement, Fire-Proof Paints, etc.

87 MAIDEN LANE, NEW YORK.

JERSEY CITY, CHICAGO, PHILADELPHIA, BOSTON, LONDON.

IRON AND STEEL ROOFING,

Corrugated Iron, Galvanized Eave Trough
and Conductor Pipe, Roofing Paints, etc.

Cambridge Roofing Co., Cambridge, O.

Lukens Iron and Steel Co. INCORPORATED 1890.

The First to make Boiler Plates in America.

Chas. Huston, Pres. A. F. Huston, Vice-Prest. C. L. Huston, Genl. Mgr. Robt. B. Haines, Jr., Secy. Jos. Humpton, Treas.

STEEL AND IRON PLATES, ALSO SHEETS

TO EXTREME DIMENSIONS.

WIDTHS UP TO 10 FEET.

THICKNESS, No. 12 GAUGE TO 1½ INCHES.

—ESTABLISHED 1810.—

WORKS:

NEW YORK OFFICE:

PHILADELPHIA OFFICE:

Coatesville, Pa.

No. 29 Broadway.

62 & 64 Bullitt Bldg.

FRANK SAMUEL,
136-138 So. 4th St.,
Philadelphia.

LOW PHOSPHORUS

PIG IRON—.03 or under.
SCRAP—.03 or .05 or under.
ORE—For O. H. and Furnace Use.
MELTING BAR—
Open Hearth and Bessemer Billets,
Skelp, Muck Bars and Scrap, Foundry
and Bessemer Pig Iron.
Syracuse Tube Co.'s Tubes and Pipe.

THE PHOENIX IRON CO., 410 Walnut St., Philadelphia,

MANUFACTURE ALL THEIR PRODUCTS BOTH IN

WROUGHT IRON AND OPEN HEARTH STEEL.

Beams, Channels, Deck Beams, Angles, Tee-bars, Zee-bars and other shapes, Round, Flat and Square BARS of all sizes, Especially adapted for Bridge and Ship Builders, Fire-proof Buildings, Shafting and all Structural Purposes.

SPECIALTIES, in Wrought Iron or Steel:—Phoenix Columns and Upset Eye-Bars of all sizes,

Roof Trusses, Girders, Joists and Built-up Shapes of every description.

AGENTS:—EDWARD CORNING & Co., 29 Broadway, NEW YORK; EDWARD CORNING & Co., 70 Kilby St., BOSTON, MASS; JAMES B. STOKES, 132 Market St., SAN FRANCISCO. WESTERN OFFICE: A. C. STITES, 931 The Rookery, CHICAGO.

POTTSVILLE IRON AND STEEL CO., POTTSVILLE, PA,

PHILADELPHIA OFFICE, 226 SOUTH 4th STREET

MANUFACTURERS OF ALL KINDS OF

STRUCTURAL IRON AND STEEL,

Viz., I Beams, Deck Beams, Channels, Tees, Angles, Plates and Bars; and also Open Hearth Steel Billets, Blooms and Slabs.

BREWERY, MALT AND ICE HOUSE CONSTRUCTION A SPECIALTY.

Designers and Constructors of Roofs, Trusses, Columns, &c.

TESTED CHAINS.

BRADLEE & CO., - EMPIRE CHAIN WORKS,

Beach and Otis Streets, PHILADELPHIA.

Chains for Foundry Cranes and Slings, "D. B. G." Special Crane Chain. Steel and Iron Dredging, Slope and Mining Chains. Ship's Cables and Marine Railway Chains.

BARCLAY W. COTTON & CO.,

Successors to ESHERICK, COTTON & CO.,

Iron and Steel Merchants.

AGENTS FOR

AMERICAN WIRE GLASS MFG. CO.

418 Walnut St., PHILA.

MIFFLIN WHEELER.

G. W. NICOLLS.

Nicolls, Wheeler & Co.,

FORMERLY

SITES, WHEELER & CO.,

216 South Third St., Philadelphia, Pa

—DEALERS IN—

IRON AND STEEL SCRAP.

Pig Iron, Muck Bars, Charcoal Blooms, &c., &c.
Steel and Iron Plates, New and Old Rails.

S. T. WELLMAN, President.

J. H. ROOP, Treasurer.

C. H. WELLMAN, Superintendent

S. H. CHAUVENET, Vice-President.

RICHARD PETERS, Jr., Secretary.

WELLMAN IRON AND STEEL CO.

—MANUFACTURERS OF—

Highest Grade Open Hearth Low Phosphorus Steel Fire Box and

Boiler Plate. Bessemer Steel Ship and Tank Plate. Open

Hearth and Bessemer Blooms and Slabs.

Low Phosphorus Pig Iron.

—PLATES UP TO 126 INCHES IN WIDTH.—

General Office and Works, Thurlow, Delaware County, Pa.

Chicago, Ills., No. 656 "The Rookery."

New York, N. Y., No. 7 Nassau Street,

E. W. CRAMER, Agent.

J. H. BELCHER, Agent.

EDWARD CORNING & CO.,

MANUFACTURERS' AGENTS AND COMMISSION MERCHANTS.

BEAMS, CHANNELS,
ANGLES, TEES, PLATES,
RIVETED GIRDER.

IRON AND STEEL,

BARS, BANDS, HOOPS,
BOLTS, NUTS, RIVETS,
ROOF TRUSSES.

29 BROADWAY,
NEW YORK.

421 CHESTNUT ST.,
PHILADELPHIA.

70 KILBY ST.,
BOSTON.

OUR OFFICES AND MILLS ARE CONNECTED BY TELEPHONES.

EDWARD J. ETTING,
IRON BROKER & COMMISSION MERCHANT
 222 S. THIRD ST., PHILADELPHIA, PA.
 Pig, Bar and Railroad Iron, Old Rails, Scrap.
 AGENT FOR THE
MOUNT SAVAGE FIRE BRICK,
 Eastern Penna., West New Jersey and Delaware.
Agent TRENTON IRON CO.,
 For the Sale of Wire and Wire Rope.
 Longdale (Va.) and other Pig Irons.
 STORAGE YARD, Pier No. 57 South (old Navy Yard),
 which is connected with Penn. R. R. and its various
 connections. Negotiable Warehouse Receipts issued.
 CASH ADVANCES MADE ON IRON.

ESTABLISHED 1869.
JEROME KEELEY & CO.,
 303 WALNUT STREET, PHILADELPHIA.
Foundry & Forge Pig Irons,
Iron Ores, Coke, Coal,
Steel Blooms, Billets, Rails, etc.
Muck Bars, Blooms, Scrap Iron.
 Consulting Engineers in Metallurgy and
 Mining.

JUSTICE COX, JR.,
 218 South 4th St., Phila., Pa.
IRON and STEEL.
 — AGENT FOR —
 Haldeman, Grubb & Co's.
 Chickies Bessemer Pig Iron.
 Mahoning Rolling Mill Co's
 Best Quality Skelp Iron and Steel
 Pulaski Iron Co's
 High Grade Foundry and Forge Pig Iron.
 Hainsworth Steel Co's
 Standard Bessemer Steel Billets.
 Bars, Angles, Sheets, Tank and Bridge
 Plates, Muck Bars, Blooms, Scrap Iron
 and Tool Steel.

J. W. HOFFMAN & CO.,
 Bullitt Building, 135 So. 4th St., Philad'a,
Iron and Steel Merchants.
PIG IRON,
 Iron and Steel Plates, Sheets, Bars and Shapes. Rails,
 Cars and Locomotives. Track Equipment.
 CORRESPONDENCE SOLICITED.

JOHN L. HOGAN & CO.,
IRON COMMISSION MERCHANTS,
 Bullitt Building, 135 South Fourth St., Phila.
Agents for Brier Hill, Lehigh, Struthers
AND MURKIRK PIG IRON,
 Delaware Rolling Mill, muck bars. Youngstown Steel
 Co., Connellsville Coke.

W. H. THOMSON & CO.,
 Dealers in
IRON and STEEL and
other METALS
 FOR ALL PURPOSES,
 Room 259, Bullitt Building,
PHILADELPHIA, PA.

B. Houston. J. Max Bernard. H. H. Houston.
C. B. HOUSTON & CO.,
 Bullitt Building. **PHILADELPHIA.**

Pig Iron, Coal, Coke, Steel Rails, Structural
Iron, Steel Castings and Fire Brick.
 Sole Agents for **PAXTON ROLLING MILLS.**
STEEL AND IRON PLATES

FRANCIS WISTER,
COMMISSION MERCHANT,
COKE, COAL, ORES.
 National Foundry Coke a Specialty.
 Sulphur less than 0.6.
 All sizes National Crushed Coke.
 Bullitt Building, **PHILADELPHIA**

W. S. PILLING.

T. L. CRANE

PILLING—AND—CRANE.
IRON ORES: Lake Superior, Foreign, Concentrates,
 Magnetic and native Self-fluxing.
PIG IRON: Low Phosphorus, Open-hearth, Bessemer
 and other grades.
STEEL: In Blooms, Slabs and Billets, and scrap.
COKE: For Furnace and Foundry use.
BULLITT BUILDING, 141 S. FOURTH ST., PHILADELPHIA.

ALAN WOOD COMPANY,
 MANUFACTURERS OF
 Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom,
PLATE & SHEET IRON.
 ALSO LIGHT PLATES AND SHEETS OF STEEL,
 No. 519 Arch Street, Philadelphia, Pa.
 Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack
 Tank and Boat Iron: Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

CUMBERLAND NAIL AND IRON CO.,
 MANUFACTURERS OF
 "Cumberland" Nails & Wrought Iron Pipe,
 43 North Water St., and 44 North Delaware Ave., **PHILADELPHIA.**

J. J. MOHR,
 Bullitt Building, No. 131 South Fourth St., Philadelphia, Pa.
 —SOLE AGENT FOR—
 Sheridan, Temple, Brooke, Leesport, Mill Creek, Keystone, Mt. Laurel, Logan and Oley FOUN-
 DRY, FORGE, CHARCOAL AND BESSEMER PIG IRON.
 Dealer in Scrap, Old Car Wheels, Muck Bars and Connellsville Coke.

High Grade Tested Chains.
JAMES MCKAY & CO.,
 29TH & LIBERTY STREETS, **PITTSBURGH, PA**
 Manufacturers of Coil, Crane and Stud Chain. We also manufacture High Grade
 Steel Chain made of Basic Steel and Special Crane Chain made of U. S. Iron.

JAMES G. LINDSAY & CO.
 BULLITT BUILDING, 133 South Fourth St., PHILA.
IRON and STEEL STRUCTURAL MATERIAL
 For all purposes. Estimates Furnished for Iron and Steel Structures.



MERRILL BROS., 465 to 471 Kent Ave., Brooklyn, E.D., N. Y

FITZSIMONS & CO.,
 —MANUFACTURERS—
COLD DRAWN **SHAFTING** **IRON**
STEEL
CLEVELAND, OHIO.

NORTH BROTHERS MFG. CO.,
Iron and Brass Founders,
Light Castings a Specialty.
 N. W. Cor. 23d and Race Streets,
PHILADELPHIA.
 Correspondence solicited.

E. H. Wilson. A. Kaiser. J. B. M. Hiron.
E. H. WILSON & CO.,
 222 and 224 South Third St., Philadelphia
 BROKERS AND DEALERS IN
IRON AND STEEL.
 Correspondence solicited.

FRANCIS HOBSON, SEAMAN & CO.,

Successors to FRANCIS HOBSON & SON,
DON STEEL WORKS, SHEFFIELD.

Sole Manufacturers of

HOBSON'S "CHOICE" **(XX)** Extra Best and "Warranted Best"
Cast Steels for Tools, etc.

HOBSON'S "CHOICE" Extra Quality Needle Wire.

SEAMAN'S "NELSON" Brand Extra Cast Steel for Turning Hardest Chilled Rolls, &c.
WAREHOUSE, 97 John St., New York. CHAS. HUGILL, Agent.

THOS. FIRTH & SONS, LIMITED, SHEFFIELD.
CRUCIBLE CAST STEEL.

ABBOTT, WHELOCK & CO., Agents and Importers of
SWEDISH IRON,

85 OLIVER ST., BOSTON.

23 CLIFF ST., NEW YORK.

S. & C. WARDLOW, SHEFFIELD, ENGLAND.

Manufacturers of the Celebrated Cast and Double Shear Steel,

in Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Razors, Carvers, Butchers' Knives, Files, Band Saws, Clock, Watch and all other Springs; also Sole Makers of the Special Brand "TOUGH" Cast Steel for Leather Splitting and Machine Knives of every description, and for Turning and all other Tools, Dies and Punches.

Office and Warehouse, 95 John St., New York.

Frank S. Pilditch, Agent.

GUSTAF LUNDBERG

Agent for N. M. HOGCLUND'S SONS & CO. of Stockholm.
Swedish and Norway Iron.

Bessemer and Open Hearth Steel.

19 KILBY STREET, BOSTON.

CARLISLE **KAYSER, ELLISON & CO.,** SHEFFIELD, ENGLAND
WORKS, Late WILSON HAWKSWORTH, ELLISON & CO.,

(ESTABLISHED 1825.)

CRUCIBLE STEEL AND STEEL WIRE.

WETHERELL BROS., Agents.

81 OLIVER STREET, BOSTON.

93 LIBERTY STREET, NEW YORK.

JONAS & COLVER CONTINENTAL STEEL WORKS, SHEFFIELD, ENGLAND,

MANUFACTURERS OF ALL KINDS OF STEEL.

Tool Steel, Drill Rods, Needle Wire, Hot Rolled Sheet Steel, Cold Rolled Steel for Corset Springs, Band Saws, Clock and Watch Springs and Parts, and all other Purposes.

HERMANN BOKER & CO., 101 & 103 Duane Street,

(Formerly CARL F. BOKER),

Sole Agents and Importers of Steel and Crucible Wire Rods, &c.

JESSOP'S STEEL

MANUFACTURED BY

WM. JESSOP & SONS, L'D.

OF **Best Quality,**
IN **Bars, Sheets & Plates.**

Large assortment of sizes in stock at

91 John St. - - - - - NEW YORK,

And other Agencies.

SHEFFIELD, ENGLAND.

Gold Medal Paris.
1889.

WIRE

DRAWING

WORTLES, PLATES and JEWEL DIES.

DIES

NEWTON & SHIPMAN,

83 John St., - New York.

CAMBRIA STEEL,

Steel Rails, STANDARD AND LIGHT WEIGHTS, Street Rails and Railway Fastenings,
 BESSEMER AND OPEN-HEARTH BLOOMS, BILLETS AND BARS.
 Steel Axles, Steel Angles, Steel Channels, Steel Forgings.
CAMBRIA IRON COMPANY, Office, 218 S. Fourth St., Philadelphia.
 Chicago Office, Phoenix Building.
 (WORKS AT JOHNSTOWN, PA.)

A. & P. ROBERTS & COMPANY,
 Pencoyd Iron Works, | Pencoyd Bridge & Construction Co.,
 MANUFACTURERS OF | DESIGNERS AND MANUFACTURERS OF
 Wrought Iron and Open Hearth Steel, | Bridges, Viaducts, Turn Tables, Etc.
 OFFICE: 261 S. 4th Street, PHILADELPHIA, Pa. | WORKS, PENCYD, PA.

EICKEN & CO.'S CRUCIBLE TOOL STEEL

HAGEN WESTPHALIA, GERMANY.

SPECIAL No. 8 works and Fine-Finishes the HARDEST Rolls and Material. BOSS Cold Chisel; HIGH-GRADE ADAPTED Twist-Drill, Tap, Punch, Die, Reamer, Wood and Milling-Cutter-Steel and Blanks.

HIGHEST QUALITY, LOW PRICES, INDUCEMENTS to the TRADE and large USERS.

REPRESENTED BY { IMPORTERS AND EXPORTERS. { MARKT & CO., Agts.,
 EDW'D VORSTER. { 79-85 North Moore St. New York.

Stock for immediate wants and Trial Orders. Exclusive Local Agencies granted.

THE IRON-FOUNDER:

A COMPREHENSIVE TREATISE ON

THE ART OF MOLDING,

INCLUDING CHAPTERS ON

CORE-MAKING; LOAM, DRY-SAND, AND GREEN
 SAND MOLDING; ALSO CRYSTALLIZATION,
 SHRINKAGE, AND CONTRACTION OF CAST
 IRON, AND A FULL EXPLANATION OF
 THE SCIENCE OF PRESSURES IN
 MOLDS; ADDED TO WHICH ARE
 FORMULAS FOR MIXTURES OF
 IRON, TABLES, RULES AND
 MISCELLANEOUS INFOR-
 MATION.

BY

SIMPSON BOLLAND,

Practical Molder and Manager of Foundries

Illustrated with over Three Hundred
 Engravings.

12mo, Cloth, \$2.50.

Will be sent free on receipt of the price.

"Among the many recent additions to technical literature, we know of none of more practical value than THE IRON FOUNDER. There are thousands of men in our foundries who will be greatly benefited by its 382 pages of interesting and valuable information."—*The Age of Steel*.

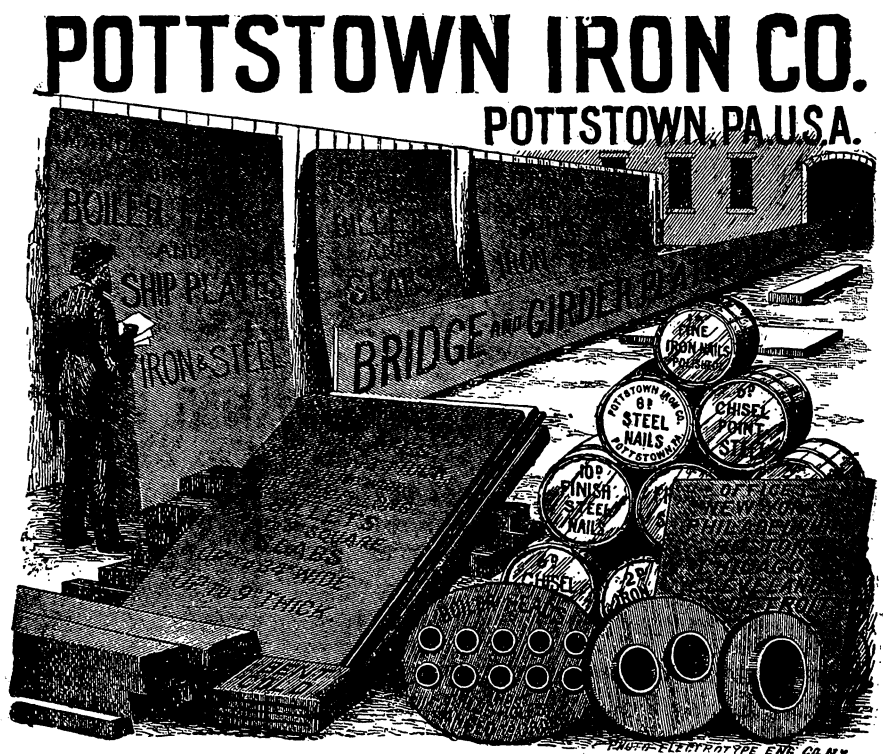
SENT, POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade St., New York.

A. MILNE & CO..
Swedish (Norway) Iron and Steel,
 BLOOMS, BILLETS, BARS; WIRE, RIVET AND NAIL RODS.
FOREIGN AND DOMESTIC IRON AND STEEL.
 1 Broadway, New York. 8 Oliver Street, Boston.



FRANKFORD STEEL COMPANY.
 FRANKFORD, PHILA., PA.
Steel Railroad and Machine Forgings,
 SOLID CRUCIBLE STEEL CASTINGS
 AND
 Best Grades of Tool and Machinery Steel.

ÆTNA-STANDARD IRON AND STEEL CO.,Successors to **Ætna Iron and Steel Co., and The Standard Iron Co.,** Manufacturers of**PLATES and SHEETS, BLACK, GALVANIZED and CORRUGATED Plain Roofing, Siding and Ceiling, also of Sheet Steel, for special purposes, Cold Rolled or Plain and Patent Leveled.****BARS, LIGHT SECTION RAILS, ANGLES, TEES and CHANNELS, odd sections and sizes, Machine Straightened Steel Tire, Ordinary Shafting, Horse-Shoe Bars, Ax-Poll Steel, Toe Calk, Nut, Bolt and Chain Rods, and other special Bars suited to every requirement.****PROMPT SHIPMENT from STOCK.**Inquiries solicited. Stock List Mailed on Application. Address, **BRIDGEPORT, OHIO.****CARBON STEEL COMPANY,****PITTSBURGH, PA.,**
—MANUFACTURERS OF—**Universal Mill Plates. Sheared Plates and Sheets. Boiler, Ship and Armor Plates. Also Nickel Steel Plates. List of Sizes Sent upon Application.****AGENCIES:****L. S. BOOMER, 647 The Rookery, Chicago, Ill.****THE CONDIT-FULLER CO., Perry-Payne Building, Cleveland, O.****GEO. KINSEY & CO., 249 West Fourth Street, Cincinnati, O.****JAS. G. LINDSAY & CO., Bullitt Building, Philadelphia, Pa.****BULLARD & POST, 125 Milk St., Boston, Mass.****The S. OBERMAYER CO.,****FOUNDRIES,****CINCINNATI, OHIO, AND CHICAGO, ILLS.**

—MANUFACTURERS OF THE HIGHEST GRADES OF—

FOUNDRY FACINGS and FOUNDRY SUPPLIES.

—IMPORTERS AND REFINERS OF—

GRAPHITE, PLUMBAGO or INDIA SILVER LEAD.

Iron, Brass or Steel Foundries Completely Equipped.

CORRESPONDENCE SOLICITED.**GENERAL CATALOGUE SENT ON APPLICATION.****Cold Drawn Seamless Steel Tubes**

—FOR—

Locomotives, Fire, Marine and other Boilers, Hydraulic Presses, Hollow Spindles, Bicycles, etc., etc.**Ellwood Shafting & Tube Co.,****Works, Ellwood City, Law. Co., Pa.****New York Office, No. 277 Broadway, Room 26.****Catalogue of Books,**

Including the principal works on Metallurgy, Mineralogy, Engineering, Electricity, Mechanics, &c., sent free to any address by

DAVID WILLIAMS, Publisher,**98-102 Reade Street, NEW YORK.**

B

—AMERICAN—

PIG IRON Storage Warrant Co.

(Bank of America Building.)

44 Wall Street, - NEW YORK.

Correspondence of Furnaces Invited.

PIERSON & CO.,

—DEALERS IN—

IRON and STEEL

OF EVERY DESCRIPTION,

29 Broadway, cor. Morris St., NEW YORK.**A. R. WHITNEY & CO.,**

MANUFACTURERS AND DEALERS IN

IRON and STEEL.**AGENCIES:****CARNEGIE STEEL CO.,** Limited, Structural Material, Steel and Iron Columns, Beams, Channels, Shapes and Plates. Steel Beams Rolled to 24 inches deep.**PORTAGE IRON CO.,** Limited, Merchant Iron, Bars, Angles, Hoops and Cotton Ties.**BROOKLYN WIRE NAIL CO.,** Steel Wire Nails. Export Nails a Specialty.**RIVERSIDE IRON WORKS,** Steel Pipe.**GLASGOW TUBE WORKS,** Boiler Flues.**AMERICAN WIRE NAIL MACHINES.** Over 900 working satisfactorily in the United States, 25 in Europe and 100 in Canada.**THE SEIDELL & HASTINGS CO.,** Charcoal-Iron Boiler Plates.

Plans and estimates furnished and contracts made for Iron and Steel Structures of every description. Please address,

29 Broadway, New York. P. O. Box 33.

"CATASAUQUA" HIGH GRADE Bars.

CATASAUQUA MFG. CO.

Charles K. Barns & Co., Agents,
224 South Fourth St., PHILADELPHIA.L. & R. WISTER & CO.,
IRON COMMISSION MERCHANTS,
257 So. 4th St., Philadelphia.Agents for the following Foundry and Forge Pig
Irons: Dunbar, Kemble, Tuscarawas (Black
Band), Wyebrooke C. & Charcoal Pig Iron,
Warner & Co.'s (Middlesboro, England),
Carbonizing and Malleable Irons.
Dealers in all kinds of Scrap Iron and Steel.HENRY LEVIS & CO.,
Manufacturers' AgentsFor Iron and Steel Rails, Car Wheels, Boilers
and Sheet Iron and General
Railway Equipments.
Old Rails, Axles and Wheels bought and sold.
234 S. 4th St., Philadelphia.

Established 1847.

A. WHITNEY & SONS,
CAR WHEEL WORKS,
PHILADELPHIA.

Special Wheels for Furnace and Mine Cars

Manhattan Rolling Mill.
JOHN LEONARD,
446 to 452 West St., New York.MANUFACTURER OF
HORSE SHOE AND BAR IRON
BLACKSMITH SUPPLIES.OGDEN & WALLACE,
85, 87, 89 & 91 Elm St., New York.
IRON AND STEEL
Of every description kept in stock.
Agents for Park, Brother & Co.'s
BLACK DIAMOND STEEL.All sizes of Cast and Machinery Steel constantly
on hand.WILLIAM H. WALLACE & CO.,
IRON AND STEEL,
10, 12 and 14 ALBANY ST.,
and 131 WASHINGTON ST.,
NEW YORK.

Wm. H. Wallace. Wm. Bispham. E. C. Wallace.

THE MAHONING VALLEY IRON CO.
—MANUFACTURERS OF—
Bar, Band, Sheet, Plate and Tank Iron,
Angle Iron, Nails, Boat Spikes and Rivets
YOUNGSTOWN, OHIO.

BETHLEHEM IRON COMPANY.

SOUTH BETHLEHEM, PENNA.

STEEL RAILS, BILLETS AND MUCK BAR, STEEL FORGINGS.

HOLLOW SHAFTING, CRANKS, ROLLS, GUNS AND ARMOR.
Rough, Machined or Finished, Fluid Compressed, Hydraulic Forged.NEW YORK OFFICE, - - - 80 BROADWAY.
PHILADELPHIA OFFICE, - - - 421 CHESTNUT ST.

PASSAIC ROLLING MILL CO., Paterson, N. J.

ROLLED STEEL or IRON BEAMS

Channels, Angles, Tees, Bars, Riveted Work, Forgings, Eye Bars, &c., &c.,
Also OPEN HEARTH STEEL BILLETS and SLABS.
NEW YORK OFFICE, - Rooms 151 and 152, No. 45 Broadway.

THE MONTGOMERY IRON & STEEL COMPANY, DANVILLE, PA.



PIG IRON, T AND STREET RAILS,

Light Rails, 12 to 40 lbs. per yard.

RAIL JOINTS, SPIKES AND BAR IRON.

NAYLOR & CO.,

New York: 45 Wall Street.

PITTSBURGH, PA.: Lewis Block. PHILADELPHIA, PA.: Bullitt Bldg.

IRON ORE, PIG IRON,
SPIEGEL AND FERRO,
IRON AND STEEL WIRE RODS, STEEL BLOOMS, BILLETS AND
SLABS, METALS AND OLD MATERIALS.

- R. M. MUSHET'S -
"SPECIAL," STEEL "TITANIC,"
 FOR
 LATHE AND PLANER TOOLS.
 (The "Trade-Marks" of which are registered in the United States.)
 MANUFACTURED ONLY BY
 SAMUEL OSBORN & CO., - - - Clyde Steel & Iron Works, Sheffield, Eng.
 SOLE REPRESENTATIVES IN THE UNITED STATES,
 B. M. JONES & CO., Nos. 11 and 13 Oliver St., Boston.
 No. 143 LIBERTY STREET, NEW YORK.

STANDARD FOUNDRY & MFG. CO., - CLEVELAND, OHIO.
 —HEADQUARTERS FOR—
LIGHT GRAY IRON CASTINGS.
 —UNEQUALED IN—
SOFTNESS and SUPERIOR FINISH.
 Our Castings in finishing will save time and tools. We solicit a trial order knowing that we can
 please you. Send samples for prices.

ESTABLISHED IN 1848. **SINGER, NIMICK & CO., Ltd.** PITTSBURGH, PA.

—MANUFACTURERS OF ALL KINDS OF—

Hammered and Rolled **STEEL.** Warranted Equal to any Produced.**HIGH GRADE SPECIAL** Crucible Tool Cast Steel, for all purposes requiring the **very finest** quality.**SINGER'S ANNEALED EXTRA** Crucible Tool Cast Steel, for Dies, Cutters, Surgical Instruments, Forceps, and all other purposes requiring an **extra fine** quality.**BEST** Crucible Tool Cast Steel, for all purposes requiring steel of **Standard** quality, such as Turning Tools, Taps, Dies, Drills, Punches, Shear Knives, Cold Chisels, or Edge and Machinists' Tools generally, and for Mining and Quarrying purposes.**SAW STEEL**, for Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.**HOT ROLLED SHEET STEEL**, for Springs, Billet Web and Hand Saws, Nicker Saws, Pocket Knives, Blades and Backs, Drawing and Stamping Cold, &c., &c.**BRIGHT COLD ROLLED SHEET and STRIP STEEL**, for Cold Drawing, Stamping and Bending; for Bells, Cups, Ferrules, Springs, Keys, Chains, Sewing Machine and Type-Writer parts, and to take the place of Sheet Brass, all of unequaled finish and accuracy of gauge,**ROUND MACHINERY STEEL**, for Shafting, Rollers, Spindles, &c., &c.**AGRICULTURAL STEEL.**

"Iron Centre" Cast Plow Steel.

"Soft Steel Centre" Cast Plow Steel.

"Soft Steel Back" Cast Plow Steel.

"Extra Thick Face Centre" Cast Plow Steel.

"Special" (Solid Soft Center) Plow Steel.

Crucible Cast Plow Steel.

Steel Rotary Harrow Discs.

Finished Rolling Plow Colters.

Agricultural Steel Cut to Pattern.

Also Wagon and Carriage Springs, Axles and Steel Tire.

Represented at **243 Pearl and 18 Cliff Streets, NEW YORK**, by**HOGAN & SON, General Agents for Eastern and New England States.**

GEORGE M. HOGAN, 417 Commerce St., Philadelphia; FITZ, DANA & CO., 110 North St., Boston, and

W. E. STOCKTON, 16 & 18 West Lake St., Chicago.

HUGH RUSSEL, TEMPLE BUILDING, 186 ST. JAMES ST., MONTREAL, CANADA.

LA BELLE STEEL CO.,

Ridge Avenue and Belmont Street, Allegheny City, Pa. Post Office Address, Pittsburgh, Pa.

MANUFACTURERS OF ALL KINDS OF STEEL SPRINGS, AXLES, RAKE TEETH, Etc.**WETHERELL BROS., EASTERN REPRESENTATIVES, 31 Oliver St., Boston, and 93 Liberty St. N.Y.**

RICE, LEWIS & SON, Toronto, Ont.

J. TATNALL LEA & CO.,

No. 125 So. Fourth St., Philadelphia.

**BESSEMER, MILL AND FOUNDRY PIC IRON,
MUCK BARS AND IRON ORES.**

— SOHO IRON & STEELWORKS —

MOORHEAD & MCLEANE CO.
MANUFACTURERS OF

PLATE IRON & STEEL.

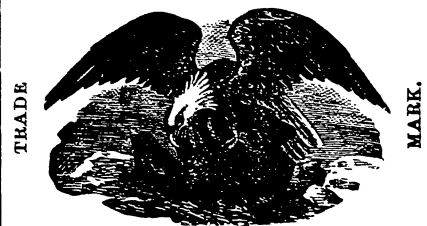
GALVANIZED SHEET IRON

SOHO CHB TRADE MARK

PLATES SPECIAL WIDE AND SHEETS AND EXTRA LONG SKELP IRONS CORRUGATED & ROOFING IRONS CURVED CORRUGATED CEILING IRONS

OFFICES AND WORKS.
PITTSBURGH.

EASTERN WAREHOUSE. No. 81 JOHN STREET, NEW YORK.
WESTERN WAREHOUSE. Nos. 16 & 18 W. LAKE ST. CHICAGO.

W. Dewees Wood Co.,

MANUFACTURERS OF PATENT

PLANISHED SHEET IRON.**PATENTS:**

Feb. 6th, 1877.	Feb. 12th, 1884.	Jan. 6th, 1885.
Dec. 10th, 1878.	Mar. 4th, 1884.	Aug. 31st, 1886.
Jan. 10th, 1882.	April 15th, 1884.	Jan. 1st, 1889.
Jan. 1st, 1884.	June 10th, 1884.	Jan. 17th, 1893.

Guaranteed fully equal, in all respects, to the Imported Russia Iron.

—ALSO—

Wood's Smooth Finished Sheet Irons and Sheet Steel, Cleaned and Free from Dust.

GENERAL OFFICES AND WORKS

MOKEESPORT PA.

Branch Office: 111 Water Street, Pittsburgh, Pa.

J. WESLEY PULLMAN

No. 238 S. Third St., Philadelphia.

BEST IRON ORESNew Jersey. New York. Lake Superior
WARWICK PIG IRON.Stay-Bolt,
Rivet, D. Link,
Axe, Hatchet,
Carriage and
Wagon Axle**IRON.****Superior Quality Refined Bar Iron**

"VULCAN" AND "LOCKHART" BRANDS.



SMALL CHANNELS AND ANGLES,

HEXAGON IRON AND STEEL.All
Merchant Bar
Sizes
of
Soft**STEEL.**

John H. Ricketson, Prest. Wm. Holmes, Treas.
A. G. Barnett, Sec'y.

A. GARRISON FOUNDRY CO.,

Manufacturers of Sand, Patent Homogeneous Steel and

Chilled Rolls

Ore and Clay Pulverizers, Rotary Squeezers, Haskin's Patent Double Spiral Pinions and Rolling Mill Castings of every description.

Office, Nos. 10 & 12 WOOD ST., PITTSBURGH, PA.

BIRMINGHAM IRON FOUNDRY,

BIRMINGHAM, CONN.

CHILLED ROLLS AND ROLLING MILL MACHINERY,

McCoy Patent Mill Pinions, Shears, Rotary Squeezers.

WIRE DRAWING MACHINERY

Special Rolling Machines for Gun Barrels, Hoes, Pick and Axe Polls, Odd Shapes and Tapers.

ESTABLISHED

1836.

POWDER

—FOR—

Blasting, Mining and Sporting
ORANGE BRAND.
ELECTRIC BLASTING APPARATUS
SAFETY FUSE, &c.

Send postal card for Illustrated Pamphlet showing sizes grains Powder, and describing Blasting Apparatus. Mailed **FREE**.

LAFLIN & RAND POWDER CO.,

New York Office, 29 Murray St.

DYNAMITE,

RED STAR BRAND

For Mining, Quarrying and Stump Blasting

Safety Fuse, Caps, Platinum Fuse, Leading and Connecting Wire, with every other requisite for Blasting Purposes. The especial attention of the hardware trade is invited to our line of goods.

NEW YORK POWDER CO.

62 Liberty St., New York.



S. CHENEY & SON, GRAY IRON CASTINGS

CHEAP HEATING STOVES,
DIAMOND THIMBLES.

MANLIUS N. Y.

CHESS BROTHERS,

MANUFACTURERS OF A FULL LINE OF

SMALL CUT NAILS, TACKS, SHOE NAILS, ETC.

Always in stock. Special goods made to order.

SOFT STEEL PLATES.

Suitable for Implement manufacture and for all Blanking or Stamping uses, of good surface, rolled carefully to gauges, ranging from No. 6 to 16, inclusive, in widths up to 15½ inches and to multiples of lengths desired. Finished black or scaled. And

EXPANDED METAL

In all its varieties of Fire-Proof Lath. Fencing, Tree Guards, &c. Send for catalogues and prices.

Office, 531 Wood St., PITTSBURGH, PA.

DROP FORGING

J. C. SPEIRS & CO. WORCESTER, MASS.

J. S. SEAMAN.
ROBT. SLEETH
GEO. BLACK

PHOENIX ROLL WORKS
SEAMAN, SLEETH & BLACK
OFFICE & WORKS
41 ST & 42ND ST & AVE. R.

ROLLS AND PINIONS
EXCLUSIVELY
FOR ALL PURPOSES.

ESTABLISHED 1870

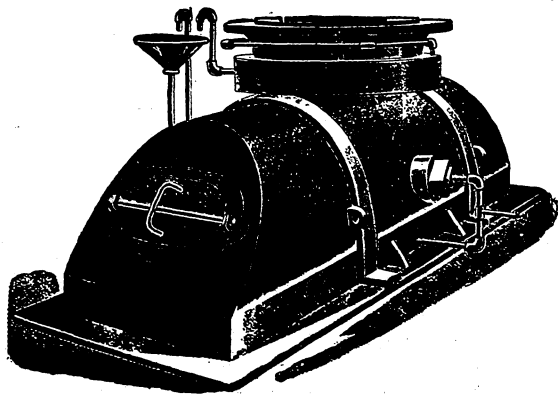
HIGGS WATER VALVE

FOR GAS FURNACES AND PRODUCERS.

Used for reversing the gas from one end of the furnace to the other. It is kept cool by water in an upper and lower chamber, and the butterfly or flapper, which prevents it from burning, warping or leaking and by its use saves from 20 to 25 per cent. of fuel, saves wasting of iron in the furnace by the shortage of gas caused by the leaking of the valve. Will last for years.

The TOTTEN & HOGG IRON AND STEEL FOUNDRY CO.,

Office and Works, 24th St. and A. V. R. R., PITTSBURGH, PA.



THE CAMBRIDGE IRON & STEEL CO.

MANUFACTURERS OF

GALVANIZED SHEET IRON
CAMBRIDGE IRON & STEEL CO. TRADE MARK
BLACK SHEETS FOR ROOFING & CORRUGATING
PICKLED & COLD ROLLED FOR STAMPING

CORRESPONDENCE SOLICITED
CAPACITY RANGES FROM NO. 30 26 INCHES WIDE TO 1' 4" 40" 120
OFFICE & WORKS CAMBRIDGE, OHIO.

—ESTABLISHED 1850.—

ARCADE MALLEABLE IRON CO.

WARREN McFARLAND & CO.

Malleable Iron and Steel Castings,
WORCESTER, MASS.

Correspondence solicited.

Prices given upon receipt of patterns or samples.

GEO. B. BUCKINGHAM.

MAHONING FOUNDRY & MACHINE SHOP,

BUILDERS OF

Blast Furnaces, Rolling Mill and Mining Machinery,

ROTARY SQUEEZERS, ORE CRUSHERS, ROLL TRAINS, SHEARS, IRON TRUCKS, &c.

Makers of Castings of all descriptions for cable and electric railroads, building fronts, columns, etc. Address

FRANK JAMESON, Manager, Danville, Pa.

RIVERSIDE IRON WORKS,

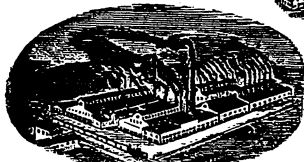
"RIVERSIDE"
Steel Nails.

Bessemer, Forge and
Foundry Pig Iron.

Manufacturers of

"RIVERSIDE"
Steel Pipe.

Steel Billets, Blooms, Bar
Steel, T and Flat Rails.



BAR MILLS, FORGE AND COAL MINES AT
WHEELING, W. VA.



RIVERSIDE FURNACE, BESSEMER
STEEL PLATE MILL AND TUBE DE-
PARTMENTS AT BENWOOD, W. VA.



FURNACE AND COAL SHAFT AT STEUBENVILLE,



NAIL FACTORIES AND WAREHOUSE AT
WHEELING, W. VA.

WHEELING, . . . W. VA.

New York Office, 21 Beekman St.

Charles S. Stephens, Eastern Representative.

TAYLOR

IRON AND STEEL COMPANY.

STEEL FOUNDERS

Licenses in the United States for making Hadfield's Manganese Steel.

STEEL CASTINGS OF EVERY DESCRIPTION.

*Specialties: Steel Tired and Solid Steel Wheels; Chilled Iron Wheels;
Iron and Steel Axles, etc., etc.*

General Office and Works, **High Bridge, New Jersey.**

GEORGE MESTA, Pres.

W. D. ROWAN, Sec.

J. O. HORNING, Treas.

LEECHBURG FOUNDRY & MACHINE CO.,

Office: LEWIS BLOCK, Pittsburgh, Pa.

Sheet and Bar Mills, Shears, Squeezers and Roll-Lathes

ROLLS. MESTA'S PATENT PICKLING MACHINES AND TIN PLATE MACHINERY.

ESTIMATES GIVEN ON COMPLETE TIN PLATE PLANTS.

THE FRASSE CO., - 19 Warren St., N. Y.

GENTLEMEN:—The special No. O (Silver Label) POLDI STEEL we obtained from you has given us excellent satisfaction. We use it when we need to make tools which will hold their edges, as they are only used in turning and planing chilled castings. We intend to adopt the POLDI STEEL entirely.

Yours truly,

(SIGNED) AMERICAN APPARATUS WORKS,
By SPINDLER.



Hundreds of testimonials showing these castings have proved the most satisfactory and economical for all purposes requiring strength and durability.

CHROME STEEL WORKS,
Brooklyn, N. Y.



**Architectural Iron and Steel and
Its Application in the Con-
struction of Buildings.**

*Fully Illustrated with Engravings from
Original Designs.*

GENERAL CONTENTS:

- Chapter I. THE MANUFACTURE OF IRON AND STEEL. Articles 1 to 24.
- Chapter II. FLOORS. Articles 25 to 51.
- Chapter III. GIRDERS. Articles 52 to 66.
- Chapter IV. CAST IRON LINTELS. Articles 67 to 76.
- Chapter V. TRUSSES. Articles 77 to 90.
- Chapter VI. STRUTS. Articles 91 to 101.
- Chapter VII. CAST IRON COLUMNS. Articles 102 to 113.
- Chapter VIII. WROUGHT IRON COLUMNS. Articles 119 to 124.
- Chapter IX. STAIRWAYS. Articles 125 to 139.
- Chapter X. ORNAMENTAL IRON. Articles 140 to 146.
- Chapter XI. ELEVATOR ENCLOSURES. Articles 147 to 150.
- Chapter XII. DOORS AND SHUTTERS. Articles 151 to 160.
- Chapter XIII. FLOOR LIGHTS AND SKYLIGHTS. Articles 161 to 185.
- Chapter XIV. HOLLOW BURNT CLAY. Articles 166 to 167.
- Chapter XV. ANCHORS. Articles 168 to 177.
- Chapter XVI. BOLTS. Articles 178 to 188.
- Chapter XVII. PRACTICAL DETAILS ILLUSTRATED. Articles 189 to 239.
- Chapter XVIII. FINISHING IRON. Articles 240 to 246.
- Chapter XIX. SPECIFICATIONS.
- Chapter XX. TABLES.
- Chapter XXI. SELECTED PAPERS ON IRON WORK, FROM THE NEW YORK BUILDING LAW, 1891.

By WILLIAM H. BIRKMIER,

8vo Cloth, - - \$3.50.

Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher & Bookseller,

96-102 Reade Street, New York.

IRON CASTINGS TO ORDER.

Small and Large Grey (or common) Iron Castings of uncommonly fine quality. Four large Cupolas run daily. Castings soft, smooth and strong. Prices very low.

We make Castings for all purposes, such as Builders' and Domestic Hardware, Electrical work, Piano and Organ, Wringer, Furniture, Lamp and Chandelier and Agricultural Implement Castings, Grates, Furnace and Machinery Castings, &c., &c. *If you buy any, write us, stating quantities. Send samples if possible.*

SESSIONS FOUNDRY CO., BRISTOL, CONN.

MCLEOD & HENRY Co
FIRE BRICK
TROY, N.Y.

ESTABLISHED 1856

HENRY MAURER & SON,
 MANUFACTURERS OF
FIRE BRICK
 of all Shapes and Sizes,
 420 E. 23d St. New York.

B. KREISCHER & SONS,
FIRE BRICK
BEST AND CHEAPEST,
 ESTABLISHED 1845,
 Office, foot of Houston Street, East River, NEW YORK

ESTABLISHED 1864.
JAMES GARDNER & SON,
 MANUFACTURERS OF
 "STANDARD SAVAGE" FIRE BRICK
 TILE and FURNACE BLOCKS
 OF ALL SHAPES AND SIZES.
 WORKS, Ellerslie, Allegheny Co., Md.
 OFFICE, Cumberland, Md.; P. O. Box 540.
 S. M. Hamilton & Co., Agents, - Baltimore, Md.
 Stowe, Fuller & Co., Agents, - Cleveland, O.

Established 1848.
OSTRANDER FIRE BRICK CO.,
 Manufacturers of
FIRE BRICK
 FOR ALL PURPOSES.
 TROY, N. Y.

Patent Tumbling Barrels.
 MANY VARIETIES
For all Kinds of Work.
 Send for new Catalogue.
HENDERSON BROS., WATERBURY, CONN.

Electric Traction on Railways and Tramways, By A. BECKENZAUN. The author has endeavored in this book to summarize as concisely as possible the present state of electric traction and to describe the various methods and constructive details which are to-day in use or which have marked consecutive steps in the development of the art. 213 illustrations, 12mo, cloth.....\$4.00
 For Sale by David Williams, 98-102 Reade St., N. Y.

THEY
PALMERS & D. MOOY FOUNDRY CO.
IRON FOUNDRY
 LIGHT GRAY CASTINGS A SPECIALTY
 LEONARD WINTER STS.

Soft Castings for Electrical Work and Sewing Machines. Fine Light Gray Iron Castings. Metal Patterns designed and made. Also Japanning and Galvanizing.

CLEVELAND, O.

STEEL CASTINGS

FROM 1 to 40,000 POUNDS WEIGHT,
 Of Open Hearth, Chester or Bessemer Steel.
True to Pattern. Sound. Solid.
 Gearing of all kinds, Crank Shafts, Knuckles for Car Couplers.
 Cross-Heads, Rockers, Piston-Heads, etc., for Locomotives.
 Steel Castings of Every Description.
Chester Steel Castings Co.
 Works, Chester, Pa. Office, 407 Library St., Philadelphia, Pa.

THE ROBINSON-REA MFG. CO.,
 PITTSBURGH, PA.

SAND AND CHILLED ROLLS.
TIN PLATE PLANTS COMPLETE.
 (No. 5.)



Before Condemning

An advertised article, try it. It's very often money in your pocket. You can't lose anything, for we offer

A SAMPLE FREE.

THE J. D. SMITH FOUNDRY SUPPLY CO.,
 CINCINNATI, O.

DROP FORGING.

ESTIMATES GIVEN ON APPLICATION.
 Sole Manufacturers of Ahlstrom's Patent Parallel Double
EXPANSION BOLTS,
 also Single Expansion Bolts. Catalogues mailed on Application.
W. C. BOONE MFG. CO. - Office and Factory, - **BOONTON, N. J.**

THE GARTLAND FOUNDRY CO.,

MANUFACTURERS OF
 Light Work our Specialty. **Soft Grey Iron Castings.** We are prepared to do Japanning and Galvanizing.
 UNION and ECHO STS., CLEVELAND, Canton & Southern R. R., CLEVELAND, O.

Cranes AND Derricks.
W. S. HALSEY & CO., - Birdsboro, Pa.

THE GALLOWAY BOILER.

Safety, Maximum Economy in Fuel, Lowest Cost of Maintenance.
Greatest Durability, Large Steam and Water Spaces.

Are the Advantages Offered by this Boiler.

SPECIFICATIONS AND PRICES UPON APPLICATION TO

EDGE MOOR IRON COMPANY.

Post Office, Wilmington, Delaware.

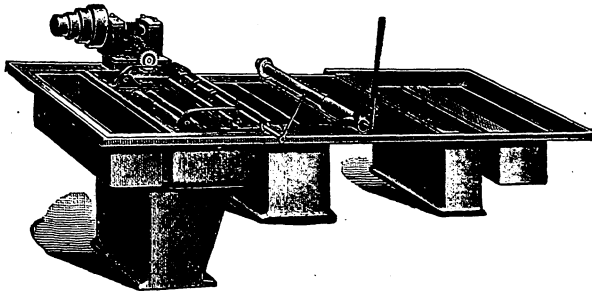
WILLIAM SELLERS, Pres't. JOHN SELLERS, Jr., Vice-Pres't. H. B. BRADFORD, Supt.
WM. F. SELLERS, Secretary. WILLIAM H. CONNELL, Treasurer.
F. W. HEISLER, Purchasing Agent.



THE LLOYD BOOTH CO.,

YOUNGSTOWN, OHIO.

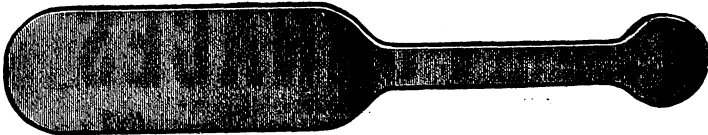
Tinning
MACHINERY.



Rolling Mills,
Sand and Chilli
ROLLS.

WYMAN & GORDON, Worcester, Mass.

DROP



FORGINGS.

GRAY IRON, BRASS, ALUMINUM and ALUMINUM BRONZE CASTINGS
of the very best quality.

Very much time saved by using clean and soft castings. We use only the best material. A trial will convince you. PICKETS and ROSETTES for Wire Workers. Catalogue of same. NICKEL PLATING and JAPANNING, also METAL PATTERN MAKING. We invite correspondence.

HAIGHT & CLARK, - - ALBANY, N. Y.

DROP FORGINGS

Of Every Description, in Iron, Steel, Copper and Aluminum.

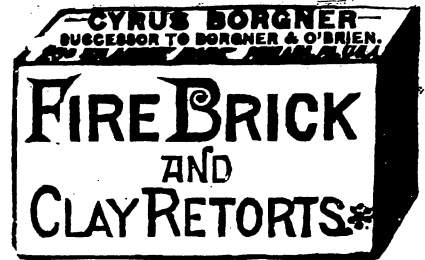
Hoist Hooks, Shafting Collars, Eye Bolts, Wrenches, Machine Handles, Fence Ornaments.

SPECIAL ATTENTION GIVEN TO THE MANUFACTURE OF
SPECIAL FORGINGS.

PHILADELPHIA DROP FORGE COMPANY,

Office and Works, S. E. Cor. American and York Sts., Philadelphia.

New York Agents: BATT, BONNELL & THOMPSON, 34 Dey St., N. Y.



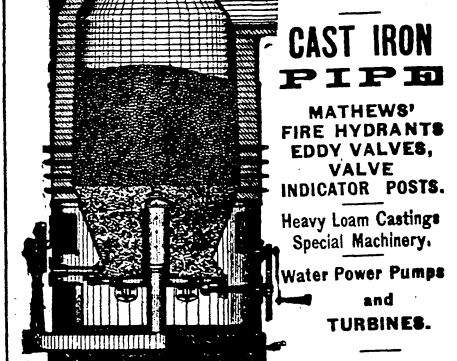
R. D. Wood & Co. 400 Chestnut St. PHILADELPHIA.

SOLE MAKERS OF THE

TAYLOR REVOLVING-BOTTOM GAS PRODUCER.

The best Producer for either Bituminous or Anthracite coal or Lignite; absolutely continuous in operation, as the fire is cleaned without stopping the flow of gas. Less labor required and less waste than in any other Producer. Producer Gas for firing Lime, Brick and Pottery Kilns, Sugar-house Char Kilns, Boilers, etc.

Also applicable to all Regenerative Furnaces. Send for Pamphlet.



CAST IRON PIPE

MATHEWS' FIRE HYDRANTS EDDY VALVES, VALVE INDICATOR POSTS.

Heavy Loam Castings Special Machinery.

Water Power Pumps and TURBINES.

HYDRAULIC JIB and TRAVELING CRANES, FREIGHT and CAR LIFTS, Etc. GAS HOLDERS and GAS MACHINERY.

A Trial will Convince You

THAT WE MAKE
SOFT AND SMOOTH
Light Gray Iron Castings,

- - SOUND - -

Brass and Bronze Castings

TRUE TO THE PATTERN.
Also HAVE FACILITIES FOR FINISHING.
Sample for estimate solicited.
I. S. SPENCER'S SONS, Guilford, Conn.

DONALDSON IRON COMPANY,
MANUFACTURERS OF



CAST IRON PIPE
And Special Castings for Water and Gas. Also Flange Pipe
Emaus, Lehigh Co., Pa.

FINE GRAY IRON

FRANKLIN IRON FOUNDRY,

The Burr and Houston Company

33-39 Franklin Street, Brooklyn (Greenpoint), N. Y.

Special Attention Given to Fine Castings.

Telephone Call, Greenpoint 174

Triple and Quadruple Expansion Engines and Boilers and their Management. By A. RITCHIE LEASK. 59 illustrations, 12mo, cloth, \$2.00
For Sale by David Williams, 96-102 Rensselaer St., N. Y.

ROLL

LATHES.

TRETHEWEY MFG. CO., - 47th ST., PITTSBURGH, PA.

MANUFACTURERS OF

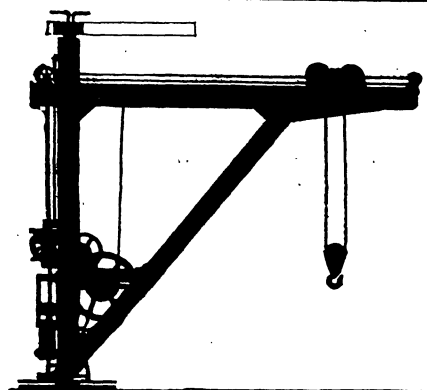
Hardened Forged Steel Rolls, Roll Turning Tools, Solid Steel Shear Knives, Tool Steel Dies of any size, Forgings of Machinery or Tool Steel, Rolling Mill Machinery, Steam Hammers, Squaring Shears, Double Headed Rotary Shears, Shear Grinding Machinery. Circle Cutting Machines.

McCLURE, AMSLER & CO.,
Engineers and Contractors,
Bissel Block, Pittsburgh, Pa.

BLAST FURNACE CONSTRUCTION
A SPECIALTY.

General Agents for Massick's and Crooke's Patent Fire Brick Stoves; Designs and Estimates for the construction of Blast Furnace Work, and for all kinds of Hot Blast Fire Brick or Pipe Stoves; and all other kinds of Brick Work pertaining to Steel Plants, Iron, Brick or Wooden Buildings, all kinds of Iron Construction in general.

We propose to put into successful operation all the plants we design and contract for.



Cranes

FOR EVERY POSSIBLE PURPOSE.

Detroit Foundry Equipment Co.

THE WHITING CUPOLA,
 LADLES, TRUCKS, TUMBLERS, ELEVATORS.
 Whiting's Improved Car Wheel Foundry Plant.
 DETROIT: CHICAGO:
 Michigan Ave. & D. & B. C. Ry. 225 Dearborn Street.
 NEW YORK: 182 Front Street.

Frank C. Roberts & Co.,
 CIVIL ENGINEERS.

Blast Furnaces, Steel Works, Rolling Mills, Iron and Steel Bridges and Buildings, Factory and Warehouse Construction

OFFICES:

S. E. Cor. 4th and Chestnut Sts., Philadelphia, Pa.

HENRY AIKEN,

Consulting Mechanical Engineer,

Rooms 203-206 Lewis Block,
 PITTSBURGH PA.

THE S. R. SMYTHE COMPANY,

LEWIS BLOCK, ENGINEERS AND CONTRACTORS, PITTSBURGH, PA.

Regenerative Gas Furnaces and Gas Producers
For All Purposes.

TUBE, STEEL, ROLLING MILLS, GLASS WORKS CONSTRUCTION, Etc.

We contract for complete Plants, guarantee results and operation. OVER 100 PLANTS BUILT AND WORKING.

McAULEY FEED WATER HEATER AND PURIFIER. Clean Boilers Guaranteed at small cost. No scale, better service, and saving in fuel.

JULIAN KENNEDY.

Consulting and Contracting Engineer,

Rooms 36, 37, 38, 39 Vandergrift Building, Pittsburgh, Pa.

Blast Furnaces, Bessemer and Open Hearth Steel Works, Rolling Mills.

STEAM AND HYDRAULIC MACHINERY, &c.

—Branch Office of The Latrobe Steel Works.—

Wm. Swindell & Bros.,

ENGINEERS AND CONTRACTORS,

Regenerative and Recuperative Gas Furnaces for
 Steel, Iron and Glass.

SWINDELL'S IMPROVED GAS PRODUCERS,

243 BUILT SINCE APRIL 1, 1891.

P. O. Box 945.

548 Smithfield St., Pittsburgh, Pa.

ALEX LAUGHLIN & CO.

LEWIS BLOCK, PITTSBURGH, PA.

GAS HEATING
 GAS PUDDLING
 CRUCIBLE
 OPEN HEARTH
 TUBE WELDING

FURNACES

AND ARTIFICIAL GAS PRODUCERS OF EVERY DESCRIPTION, FOR ROLLING MILLS, STEEL AND TUBE WORKS.
 We guarantee to place all plants erected by us in successful operation.

J. A. HERRICK, M. E.,

Consulting Engineer and Contractor:
 Room 609, 284 Pearl Street, NEW YORK.

—STEEL CASTING PLANTS A SPECIALTY.—

Melting and Heating Furnaces of ALL KINDS.

Patent Gas WATER VALVES. Improved "BASIC" and "SEMI-STEEL" Processes and FURNACES.
 New CONTINUOUS Gas PRODUCERS.

PARTIES DESIRING

SUPERIOR QUALITY LIGHT MALLEABLE CASTINGS

(SOMETHING MUCH BETTER THAN THE ORDINARY)

FROM THEIR OWN PATTERNS—MOLDED TRUE TO PATTERN—IN QUICK TIME—AND AT REASONABLE PRICES—ARE REQUESTED TO SEND SAMPLES, STATING QUANTITY USED, TO

WALTER W. WOODRUFF & SONS,

MOUNT CARMEL, CONN.

JAMES HEMPHILL, President.
WM. H. CONLEY, Treasurer.

THOS. B. RITER Vice-President
JNO. F. WILCOX, Gen'l Manager.

PITTSBURG IRON & STEEL ENGINEERING CO.

LEWIS BLOCK, PITTSBURG, PA., U. S. A.

BESSEMER AND OPEN-HEARTH STEEL PLANTS.

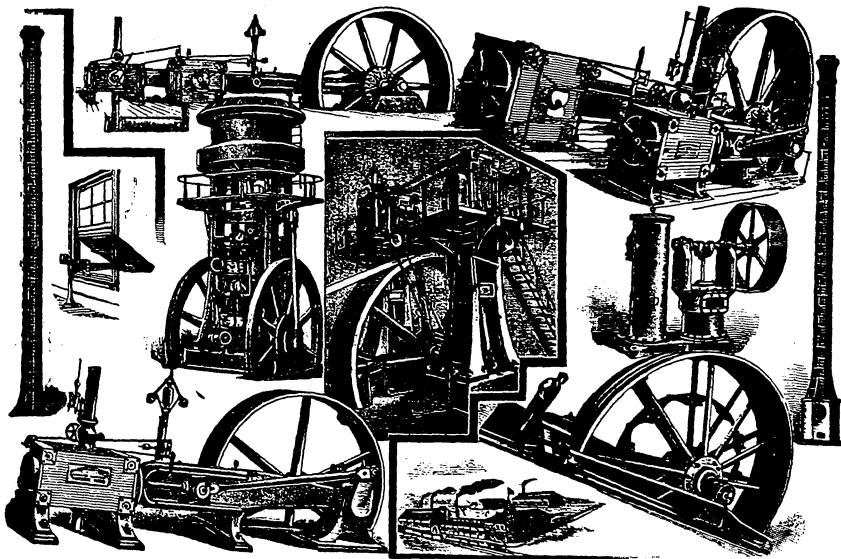
Rolling Mills (Blooming, Rail, Plate, &c). Blast Furnaces, Engines
Boilers, Bridges, Girders, Iron Buildings.

WORKS BUILT COMPLETE and Fully Equipped for Operation.

THE D. R. LEAN COMPANY, Blast Furnace and Steel Plant Construction,

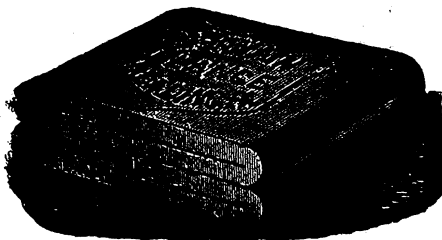
Penn Building, Pittsburgh, Pa.

PHILADELPHIA CORLISS ENGINES.
AIR PUMPS AND CONDENSERS.
BAND AND FLY WHEELS. STEEL-PLATE CHIMNEYS.
BLOWING ENGINES.



BUILT BY
PHILADELPHIA ENGINEERING WORKS, LIMITED,
MIFFLIN STREET, EAST OF FRONT,
PHILADELPHIA, PA.

TENSILE } 56,000 to 64,000 lbs.
STRAIN }



CAPACITY. { Plates 1 inch thick to No. 12.
30 feet long.
70 inches wide.

WM. McILVAIN & SONS, READING, PA., MANUFACTURERS OF IRON AND STEEL BOILER PLATES.

Locomotive, Fire Box, Flange, Shell,
Tank Iron and Steel, including Plates for
Bridges, Girders, Stacks, Pipe and Fire
and Burglar-proof Safes.

THE ALLENTOWN ROLLING MILLS,

MANUFACTURERS OF

Pig Iron, Merchant Bar Iron, Rolled Shafting, Mine Rails, I-Beams, Tee Bars, Fish
Plates, Bolts, Nuts and Spikes.

Transfer and Locomotive Turn Tables, Blast Furnace, Rolling Mill and Mining Ma-
chinery, Mining Pumps, Etc. Roll Trains, Shears, Punches, Iron Trucks, Etc. Builders
of all classes of Machinery. Makers of Castings of all descriptions for Cable and
Electric Railway. ALLENTOWN, PA.

Haines Gauge Co.,

906 Filbert St.,

PHILADELPHIA,
PA., U. S. A.



The HAINES Automatic Micrometer Rolling
MILL GAUGE.

For reducing HOT WORK in process of rolling

The Iron-Masters' LABORATORY

Exclusively for the
*Analysis of Ores of Iron, Pig and Manu-
factured Iron, Steels, Limestone, Clays,
Slags and Coal for Practical
Metallurgical Purposes.*

Branch Office, 339 Walnut St., Philadelphia.

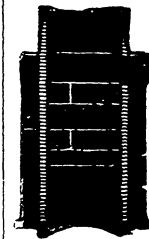
All Analytical Work at Warrenton, Virginia.
J. BLODGET BRITTON.

This laboratory was established in 1866, at the
instance of a number of practical Iron Masters,
expressly to afford prompt and reliable infor-
mation upon the chemical composition of the
substances above mentioned, for smelting and
refining purposes, the object being to make it
at once a convenient, practically useful, and
comparatively inexpensive adjunct to the Fur-
nace, Forge and Rolling Mill.

VICTOR COLLIAU,

Sole builder of his

New and Improved Patented



HOT-BLAST
Colliau Cupola,
287 Jefferson Ave.,
DETROIT, MICHIGAN,
U. S. A.

M. V. SMITH, PRES.
C. C. MORROW, SEC.

M. A. GREENE, VICE-PRES.
JOHN A. ELLIOTT, TREAS.

Artificial Gas Engineering Co., Consulting and Contracting ENGINEERS.

ARTIFICIAL Gas applied to all Branches
of Manufacturing and Domestic Uses.
Apparatus for the Manufacture of
Coal-Gas Furnished at Lowest Prices

706 TIMES BUILDING,
PITTSBURGH, PA.

EXHAUST TUMBLERS,

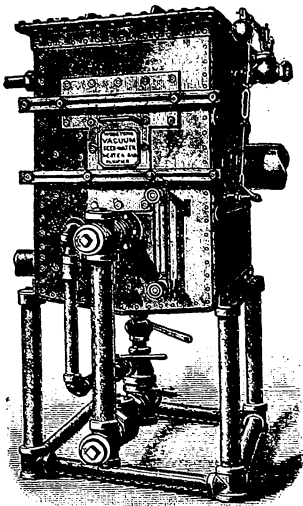
Hexagon, Round or Wooden
BEST AND CHEAPEST.

WM A. SWEETSER.

39 Montello St., Brockton, Mass.

**A Practical Workshop Compan-
ion for Tin, Sheet-Iron and
Copper-Plate Workers.** By LEROY J. BLINZ
new revised, enlarged edition. with over 170
newly engraved illustrations: 296 pages; 12mo.
cloth.....\$2.50

This deservedly popular book has been thor-
oughly revised and contains over 100 additional
pages. with 170 newly engraved illustrations.
The volume contains rules for describing vari-
ous kinds of Patterns used by Tin, Sheet-Iron
and Copper-Plate Workers: Practical Geometry;
Mensuration of Surfaces and Solids; Tables of
the Weights and Strengths of Metals and other
Materials; Tables of Areas and Circumferences
of Circles; Composition of Metallic Alloys and
Solders, with numerous valuable Receipts and
Manipulations for every-day use in the work-
shop. Sent, post-paid, on receipt of price by
DAVID WILLIAMS, Publisher,
93-103 Reade St., New York,



3—MEDALS and DIPLOMAS—3
Worlds' Columbian Exposition.

Webster's Vacuum Feed Water Heater and Purifier.

Webster's Steam and Oil Separators.

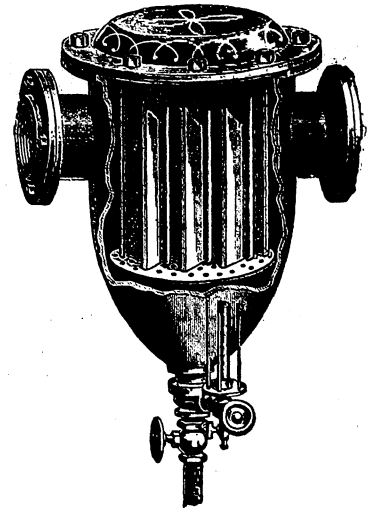
Willames' Vacuum System of Steam Heating.

BEFORE PURCHASING

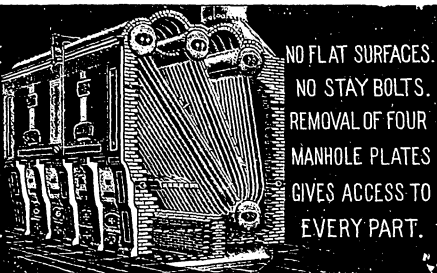
consider our prices and guarantees. We can effect a greater saving, all points considered, than any feed water heater in the market.

Warren Webster & Co.,

No. 2 Canal St., Chicago. Office and Works, Camden, N. J.



SAFE. EFFICIENT.
ECONOMICAL.
DURABLE.
PRACTICALLY
SELF-CLEANING.
NO CAST METAL.



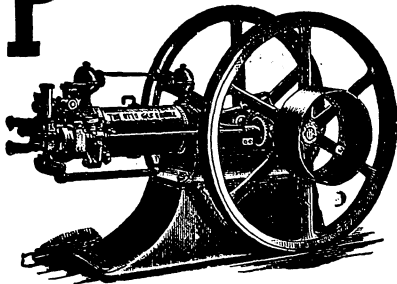
NO FLAT SURFACES.
NO STAY BOLTS.
REMOVAL OF FOUR
MANHOLE PLATES
GIVES ACCESS TO
EVERY PART.

THE STIRLING WATER TUBE SAFETY BOILER.

74 Cortlandt St., New York.
418 Walnut St., Phila.
Cuyahoga Building, Cleveland.

THE STIRLING CO.,
Gen'l Offices, Pullman Building,
CHICAGO, ILL.

POWER FROM GASOLINE.



DIRECT FROM THE TANK.

CHEAPER THAN STEAM. No Boiler. No Steam. No Engineer.
FOR USE EVERYWHERE.

OTTO GASOLINE ENGINES, Stationary or Portable.
1 to 50 H. P. 8 to 20 H. P.

Running Expenses, Less than one cent per horse power per hour. For large engines, one-half cent per horse power per hour. Suitable for all manufacturing purposes, Electric Lighting, Town Water Supply. The Best Auxiliary Power for Night Work.

OTTO GAS ENGINE WORKS,

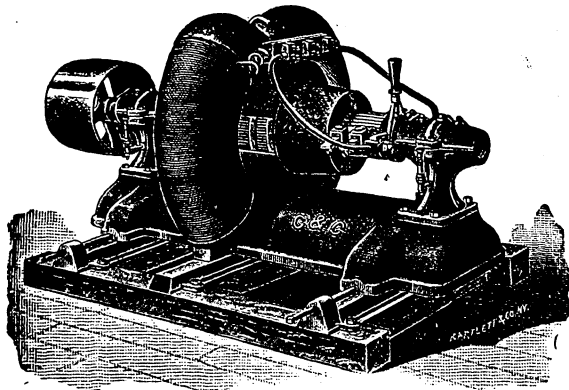
33d and Walnut Sts., PHILADELPHIA, PA.

CHICAGO OFFICE: 245 Lake St.

BOSTON OFFICE: 19 Pearl St.

C. & C. DYNAMOS & MOTORS.

Highest Economy, Perfect Regulation.



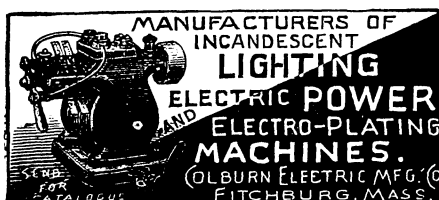
Wide experience in and special attention paid to,
Electric Transmission Power Plants for Mills,
Factories and Machine Shops.

THE C. & C. ELECTRIC CO.

GENERAL OFFICES:

402 and 404 Greenwich St., New York.

BRANCH OFFICES: { BOSTON, 63 Oliver Street.
CHICAGO, 201 Madison Street.
PHILADELPHIA, 633 Arch Street.
CLEVELAND, Cuyahoga Building.



MANUFACTURERS OF
INCANDESCENT
LIGHTING
ELECTRIC POWER
AND
ELECTRO-PLATING
MACHINES.
(OLBURN ELECTRIC MFG. CO.)
FITCHBURG, MASS.

Steel and Iron.

Comprising the practice and theory of the several methods pursued in their manufacture, and of their treatment in the rolling mill, the forge and the foundry. By W. H. GREENWOOD, \$2.00. Sent, postpaid, on receipt of price, by DAVID WILLIAMS, Bookseller and Publisher 98-102 Reade Street New York



BEVEL GEARS
PLANED PERFECTLY BY PATENTED PROCESS
GLEASON TOOL CO.
ROCHESTER, N.Y.

Awarded the Grand Prize at Late Paris Exposition.

SEND FOR THIS BOOK

FREE ON APPLICATION.

BABCOCK & WILCOX CO. WATER TUBE

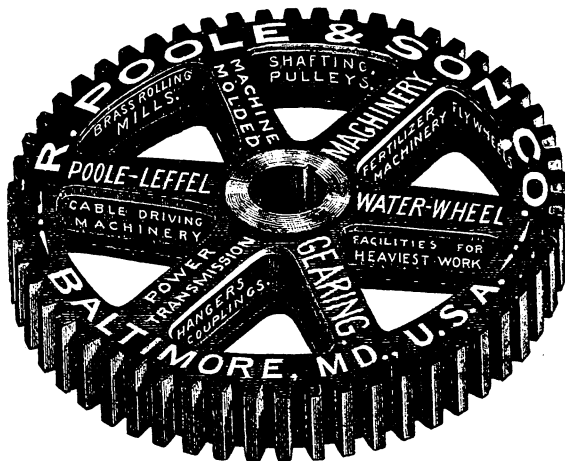
30 CORTLANDT ST. N.Y.

BRANCH OFFICES:

BOSTON, MASS. 8 OLIVER ST.
PHILADELPHIA, PA. 32 N. 5TH ST.
PITTSBURGH, PA. 408 LEWIS BLOCK
CLEVELAND, O. 412 PERRY-PAYNE BLDG.
CHICAGO, ILL. 45 S. JEFFERSON ST.
MINNEAPOLIS, MINN. 604 CORN EX.
NEW ORLEANS, LA. 57 CARondelet ST.
HAVANA, CUBA. 116 1/2 CALLE DEL ARMA.

STEAM BOILERS

MANUFACTORIES IN UNITED STATES, SCOTLAND, FRANCE, GERMANY & AUSTRIA.



ROCK DRILLING AND AIR COMPRESSING

MACHINERY

—FOR—

TUNNELS, QUARRIES,

MINES, RAILROADS,

And wherever Ore and Rock are to be Drilled
and Blasted.

RAND DRILL CO.,

23 Park Place, New York.

Branch Offices: Monadnock Building, Chicago; Ishpeming, Mich.;
1816 18th Street, Denver; Sherbrooke, P. Q., Canada; Apartado 830,
Mexico City.



TO OBTAIN DRY STEAM

PLACE A

STRATTON SEPARATOR

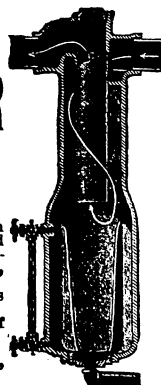
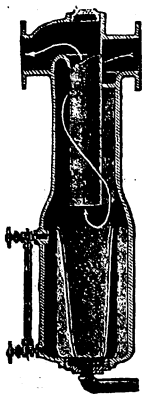
In Your Steam Pipe.

Over 400,000 Horse Power in use.

This is the only apparatus that automatically separates water from steam, and secures the maximum of Economy, Efficiency and Safety. These Separators are used by the U. S. Navy, by the leading Electric Light Cos., Sugar Refineries, Paper Mills, Water Works, Railroads and Steam Vessels. Steam Chimneys or Drums are unnecessary when this Separator is used.

Send for our new publication, "Dry Steam the Foundation of Economy." Sent free on application.

The GOUBERT MFG. CO., Sole Mfrs., 32 Cortlandt St., New York.



BOOKS

—ON—

Mechanical and Steam Engineering.

The Slide Valve Practically explained.

Embracing simple and complete practical demonstrations of the operation of each element in a slide-valve movement, and illustrating the effects of variations in their proportions by examples carefully selected from the most recent and successful practice. By JOSHUA ROSE, M. E. Illustrated by 35 engravings; 100 pages; cloth.....\$1

Twenty Years with the Indicator.

Being a practical text book for the engineer or the student, with no complex formulae. By THOMAS PRAY, JR., consulting, constructing, civil and mechanical engineer, &c. Newly arranged; complete in one volume; 284 pages; cloth.....\$2.50

The English and American Mechanic.

An every-day handbook for the workshop and factory, containing several thousand receipts, rules and tables indispensable to the mechanic, the artisan and the manufacturer. By B. FRANK VAN CLEVE. A new enlarged edition by EMORY EDWARDS, M. E. 476 pages, illustrated; cloth.....\$2

A Treatise on Belts and Pulleys

Embracing full explanations on fundamental principles, proper disposition of pulleys, rules for determining widths of leather and vulcanized rubber belts and belts running over covered pulleys; strength and proportions of pulleys, drums, &c.; together with the principles and necessary rules for rope gearing and transmission of power by means of metallic cables. By J. HOWARD CROMWELL, Ph. B., author of a Treatise on Toothed Gearing; 271 pages; cloth...\$1.50

Constructive Steam Engineering.

A descriptive treatise, embracing engines, pumps and boilers and their accessories and appendages. By JAY M. WHITHAM, M. E., C. E. 900 pages; 795 illustrations, many of which are full page and folding plates; cloth.....\$10

The American Steam Engineer.

Theoretical and practical, with examples of the latest and most approved American practice in the design and construction of steam engines and boilers of every description. For the use of engineers, machinists, boiler makers and students. By EMORY EDWARDS, M. E. Illustrated by 77 engravings; 419 pages; cloth.....\$2.50

Modern Steam Engines.

An elementary treatise upon the steam engine, written in plain language, for use in the workshop, as well as in the drawing office, giving full explanations of the construction of modern steam engines, including diagrams, showing their actual operation; together with complete but simple explanations of the operations of various kinds of valves, valve motions and link motions, &c., thereby enabling the ordinary engineer to clearly understand the principles involved in their construction and use, and to plot out their movements upon the drawing board. By JOSHUA ROSE, M. E. Illustrated by 423 engravings; 321 pages, 10 x 12 inches; cloth.....\$6

A Treatise on Toothed Gearing.

Containing complete instructions of designing, drawing and constructing spur wheels, bevel wheels, lantern gear, screw gear, worms, &c., and the proper formation of tooth profiles. For the use of machinists, pattern makers, draftsmen, designers scientific schools, &c. With many plates. By J. HOWARD CROMWELL, Ph. B. Third edition; 245 pages; cloth.....\$1.50

Stationary Steam Engines.

Especially adapted to electric lighting purposes. Treating of the development of steam engines—the principles of construction and economy, with description of moderate speed and high speed engines. By Prof. R. H. THURSTON. Fourth edition; 177 pages; cloth.....\$1.50

Any Book published sent, post-paid, upon receipt of price, by

DAVID WILLIAMS,

Publisher and Bookseller,

96 - 102 Reade St., New York.



THOROUGH INSPECTIONS

And Insurance against loss or damage to property and loss of life and injury to persons caused by

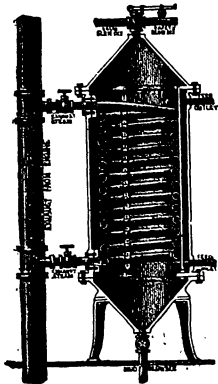
Steam Boiler Explosions

J. M. ALLEN, Pres. WM. B. FRANKLIN, Vice-Pres. F. B. ALLEN, 2d Vice-Pres. J. B. PIERCE, Sec. and Treas.

BOARD OF DIRECTORS:

J. M. ALLEN, President.
 FRANK W. CHENEY, of Cheney Brothers Silk Manufacturing Co.
 CHARLES M. BEACH, of Beach & Co.
 DANIEL PHILLIPS, of Adams Express Company.
 RICHARD W. H. JARVIS, President Colt's Fire Arms Manufacturing Co.
 THOMAS O. ENDERS, of the United States Bank.
 LEVERETT BRAINARD, of the Case, Lockwood & Brainard Co.
 GEN. WM. B. FRANKLIN, late Vice-President Colt's Pat. Fire Arms Mfg. Co.
 NELSON HOLLISTER, of the State Bank, Hartford.

HON. HENRY C. ROBINSON, Attorney at Law, Hartford.
 HON. FRANCIS B. COOLEY, of the National Exchange Bank, Hartford, Conn.
 A. W. JILLSON, late Vice-Prest. Phoenix Fire Insurance Co., Hartford, Conn.
 EDMUND A. STEADMAN, President of the Fidelity Co., Hartford, Conn.
 GEORGE BURNHAM, Baldwin Locomotive Works, Philadelphia.
 HON. NATHANIEL SHIPMAN, Judge U. S. Circuit Court.
 C. C. KIMBALL, Prest. Smythe Manufacturing Co., Hartford, Conn.
 PHILIP CORBIN, of P. & F. Corbin, New Britain, Conn.



THE AMERICAN FEED WATER HEATER

Received the First Prize at the

Mechanics' Association Fair, - Boston, Mass.

What you get when you buy the AMERICAN HEATERS:

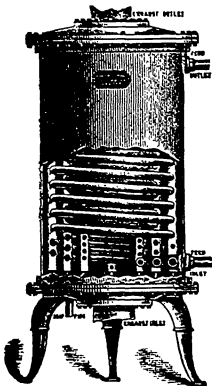
COPPER COILS,
 SOLIDLY BRAZED,
 GUN METAL FITTINGS
 AND CLAMP STAYS,
 STEEL SHELLS,

NO RUSTING OUT,
 NO LEAKY JOINTS,
 NO TROUBLE FROM EXPANSION,
 NO BACK PRESSURE,
 NO OIL IN BOILER.

We guarantee this Heater to be the Most Durable, Effective and Cheapest

WHITLOCK COIL PIPE CO.,

27 South Street, - - - - - Elmwood, Conn.



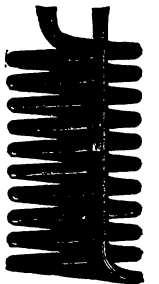
The National Feed Water Heater

is a BRASS COIL HEATER, delivering water to the boilers at 212° Fahrenheit. It is low in price, but unequalled in efficiency. 500,000 H. P. in daily use attests its merits.

Coils and Bends of Iron, Brass, and Copper Pipe.

THE NATIONAL PIPE BENDING CO.,

98 River St., New Haven, Conn.



THE EYNON-EVANS MANUFACTURING CO.,

Patentees and Manufacturers of **THE EYNON-KORTING COMPOUND INJECTORS.**

Extra Heavy Globe and Angle Valves.  Brass Castings up to 5000 lbs.

Blowers, Ventilators, Blast Nozzles, Exhausters, Brass Syphons, Acid Syphons, Condensers.

Fifteenth and Clearfield Sts., Philadelphia, Pa.

NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUB

FILL YOUR HEADS

with sound sense and your pockets with dollars. No better aid to do this can be offered you than to use **BONNELL'S NUBIAN IRON ENAMEL.** Always reliable, always the same. We do not do like many varnish houses do, who put all stuff that is no good for anything else into their black varnish. We make every lot from a regular formula. For all iron work that you want to paint black it has no equal. As cheap as asphaltum and far better.

77 Warren St., New York, N. Y.
 Hall & Carpenter, Philadelphia.
 Taylor Goodrich, San Francisco.

THE NUBIAN IRON ENAMEL CO.,

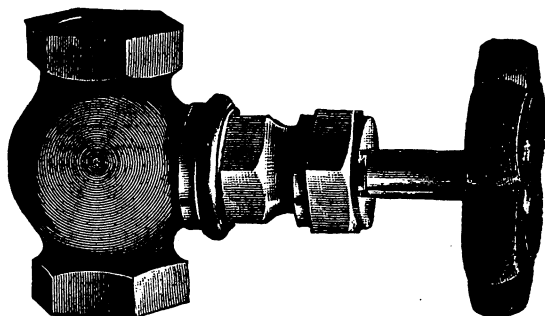
33-35 Nubian Ave.,
 CHAGIN, ILL.

NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUB

**BLAST FURNACES,
ROLLING MILLS,
STEEL WORKS,
MINES, ETC.,
ETC.**



**OIL WELLS,
REFINERIES,
ELECTRIC LIGHT PLANTS
WATER WORKS, ETC.,
ETC.**



McNAB & HARLIN MFG. CO.,
—MANUFACTURERS OF—
BRASS COCKS AND VALVES
For Steam, Water and Gas.

Wrought Iron Pipe and Fittings. Plumbers' Materials. Seamless
Brass and Copper Tubes.

Factory, PATERSON, N. J.

56 JOHN ST., N. Y.

Catalogue and Price-List will be sent to the Trade with their first order, or by express, if desired, before ordering.



THE CONTINENTAL IRON WORKS

West and Calyer Streets, BROOKLYN, N. Y.,

—SOLE MANUFACTURERS OF—

**CORRUGATED FURNACES, FOR MARINE AND
LAND BOILERS.**

Made in sizes from 28 in. to 60 in. diameter, with flanged or plain ends.

Take Ferry from East 10th or 23d Streets, N. Y., to Greenpoint.

Thos. F. Rowland, Pres.

Thos. F. Rowland, Jr., Treas.

Warren E. Hill.

Chas. H. Corbett,

Vice-Pres.

**CHAPMAN VALVE
MFG. CO.**

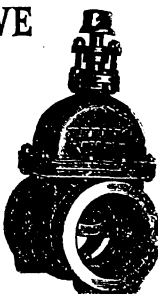
Manufacturers of

VALVES & GATES

For Water, Steam, Gas,
Ammonia, &c.

GATE FIRE HYDRANTS,

With and without independent outlets.



We make a specialty of Valves with Bronze seats for High Pressure steam.

Works and General Office,

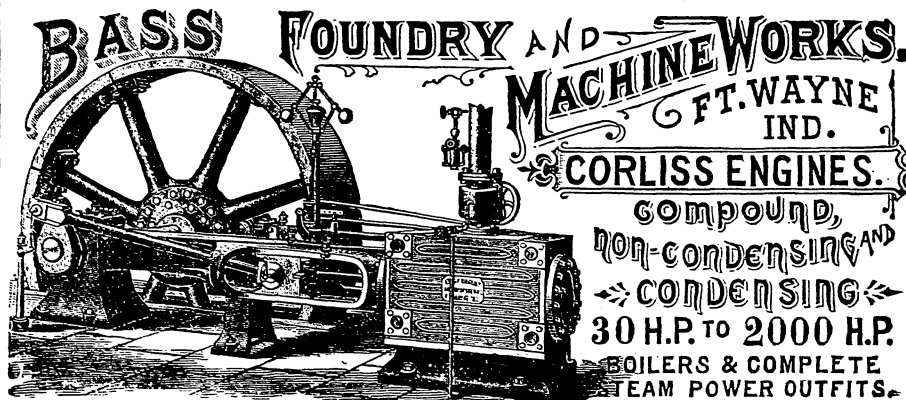
INDIAN ORCHARD, MASS.

Treasurer's Office,

72 Kilby and 112 Milk Streets,

Boston, Mass.

Chicago Office, 24 West Lake St. New York Office,
28 Platt Street.



WILLIAM TOD & CO.

YOUNGSTOWN, OHIO.

SINGLE, COMPOUND
AND CONDENSING.

**PORTER-HAMILTON
ENGINE**



Blowing Engines,
Hydraulic Cranes & Accumulators
Heavy Special Machinery.
ENGINE CATALOGUE ON APPLICATION.

OIL

AND

WATER

EASILY AND COMPLETELY RE-
MOVED FROM

STEAM

BY OUR

Cochrane Separators

FOR HORIZONTAL OR VERTICAL
PIPES.

FOR PARTICULARS ADDRESS

Harrison Safety Boiler Wks.,

Germantown Junction. PHILADELPHIA, PA.

The Buckeye Engine Co.,

SALEM, OHIO,

Have received Awards at the World's Fair as follows:

One Medal and Diploma and two Special Diplomas on Simple
Engines, Medium and High Speed, Tandem Compound and
Cross Compound Condensing and Triple Expansion Four
Cylinder Condensing Engine.

Phoenix Iron Works Company,
MEADVILLE, PENNA.,
MANUFACTURERS OF
ENGINES.

15 Cortlandt St., New York.
519 The Rookery, Chicago.

ESTABLISHED 1879. INCORPORATED 1893.

ERIE ENGINE WORKS

(CLEVELAND & HARDWICK.)

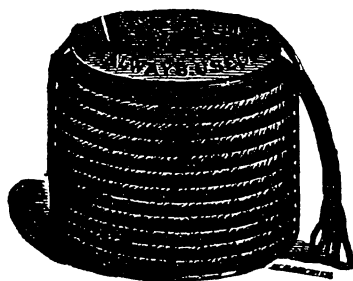


ERIE, PA.

Manufacturers of

**STEAM ENGINES
AND BOILERS.**

ROLLASON GAS ENGINES
RELIABLE AND ECONOMICAL
Send for Catalogue, etc. HAVEMEYER BLDG. NEW YORK

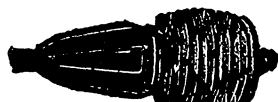


Send for a Sample of
Morrison's Patent Self-Lubricating Packing.
ROBT. MORRISON,
6034 Arsenal St., St. Louis, Mo.



Every style large or small. (See Catalogue).
BOSTON GEAR WORKS, 37 Hartford St., Boston, Mass.

THE PEERLESS.



6 Inches and Over.

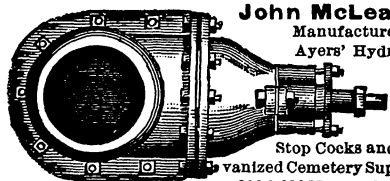


Under 6 Inches.

**STEEL
Pipe Cleaner.**

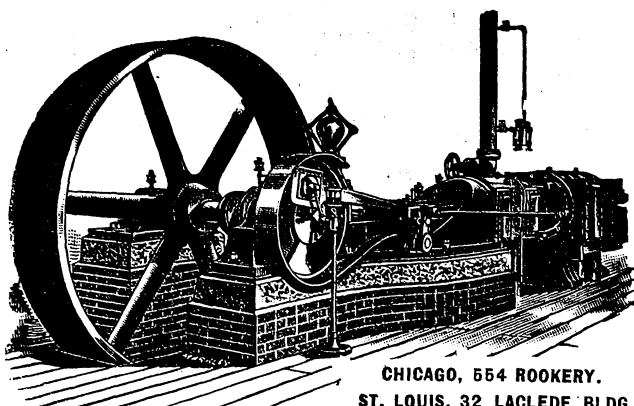
From 1½ to 16 in.

For descriptive circular and prices, address the Manufacturer.
Jas. T. Mackay,
St. Louis, Mo.



John McLean,
Manufacturer of
Ayers' Hydrants.

Stop Cocks and Gate Valves
Manufactured Cemetery Supplies
206 & 298 Monroe St., N.Y.



CHICAGO, 554 ROOKERY.
ST. LOUIS, 32 LACLEDE BLDG.

**SOUTHWARK
FOUNDRY AND
MACHINE CO.,**
Philadelphia, Pa.

Sole Makers of

**THE PORTER-ALLEN
AUTOMATIC ENGINE,**
SIMPLE, COMPOUND
OR TRIPLE EXPANSION.

Also Builders of

**BLOWING ENGINES,
REVERSING ENGINES,
CENTRIFUGAL PUMPS,
BOILERS, TANKS, ETC.**

E. L. MAXWELL, Pres.

C. A. MOORE, Vice-Pres.

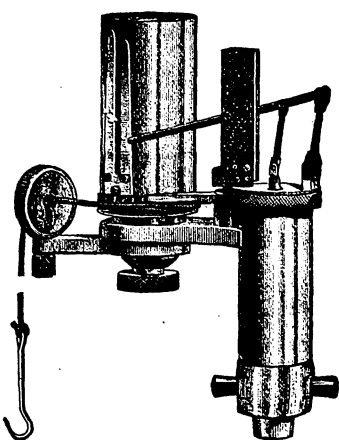
H. S. MANNING, Treas.

M. LUSCOMB, Sec.

THE ASHCROFT MANUFACTURING COMPANY

SOLE MANUFACTURERS OF

THE TABOR STEAM ENGINE INDICATOR.



The only instrument that will make accurate diagrams at either high or low speeds. In use all over the World where accuracy is desired. Approved and adopted by United States Government on the new Cruisers.

Use the Coffin Averaging Instrument; determines the area of any irregular figure. Gives mean effective pressure (M. E. P.) of an indicator diagram without computation. Absolute accuracy. Easy to manipulate. No liability to error. One diagram per minute measured without effort.

Also Steam and Vacuum Gauges, with Patent Seamless Drawn Tube, Steam Traps, Packer Ratchet Drills, Stanwood Cutters, Marine Clocks, Engine Revolution Counters, Test Gauges, Oil Cups, Test Pumps, Locomotive Spring Balances, Steam Whistles, Salinometers, and all instruments for Measuring Steam, Air, Gas, or Water.

Office and Salesroom, 111 Liberty St., N. Y.

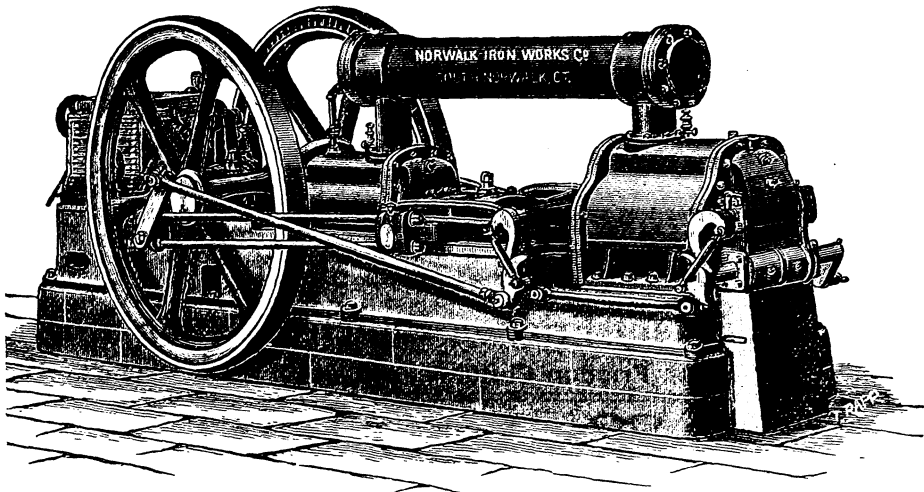
Factory, Bridgeport, Conn.

Address all Letters to P. O. Box 3754, New York.



SEND FOR CATALOGUE A.

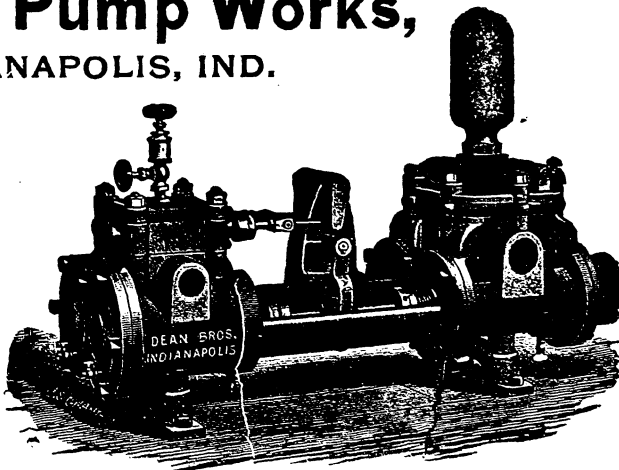
Air Compressors.



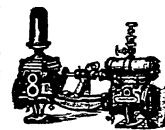
THE NORWALK IRON WORKS CO., South Norwalk, Conn.

DEAN BROTHERS
Steam Pump Works,
 INDIANAPOLIS, IND.

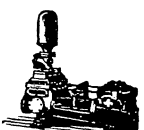
DUPLEX PUMPS.
 —
SINGLE PUMPS.
 —
DEEP WELL PUMPS.



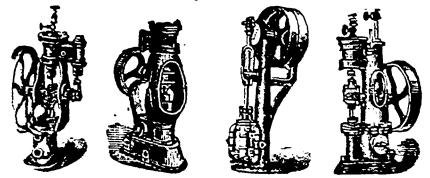
Send for Catalogue
 and Prices.



Send
 for
 Prices.



VALLEY PUMP CO.
 Easthampton, Mass.



CHEAPEST. HANDIEST. SIMPLEST. PUMPS.

Handling Dirty, Gritty and Sandy Liquids without Wear, Oil or Care. Pumping outfit for Contractors, Mining, Irrigating, Railroad, Quarry, Drainage and Manufacturing purposes. Second-hand Engines, Boilers, Pumps, and other Machinery always on hand. Exchanging.

MASLINS, 165-167 First St. Jersey City, N.J.

The JOHN H. MCGOWAN CO.

PUMPS FOR EVERY SERVICE **CINCINNATI, OHIO.** **PRICE LIST ON APPLICATION**

Factory Office 46 CENTRAL AVE.

Brass Founders and Mfrs. of every description of Brass and Iron body goods for steam, gas and water.

Worthington Steam Pumps
CONDENSERS and WATER METERS.

HENRY R. WORTHINGTON,

86 & 88 LIBERTY STREET, NEW YORK.

BOSTON

ST. LOUIS,

PHILADELPHIA,

DENVER.

CHICAGO,

The WATERBURY-FARREL FOUNDRY & MACHINE CO., Waterbury, Connecticut,
 Builders of Rolling Mill Machinery, Special Machines for finishing and making goods from Sheet Brass, Copper, Steel Silver, &c. **POWER PRESSES, HYDRAULIC PRESSES,**
 Drop Presses, Foot Presses, **RIVET MACHINES,** Gang Slitters, Grinding Machines, Steel
 Rolls, Wire Mill Machinery, Tube Drawing Machinery, Dies, &c.

AUTOMATIC REGISTER.

"The most accurate and reliable counter manufactured. Made entirely of metal."



Handsomely finished. Can be used on any machine. Send for circular.

G. EDW. OSBORN & CO.,
 391, 393 & 395 State St., New Haven, Conn.

DURANT COUNTING MACHINES

Received the Highest Award at the
 World's Columbian Exposition.



Send for
 Catalogue
 to

W. N. DURANT, 234 22d St., Milwaukee, Wis.

The Brown Hoisting and Conveying Machine Co.,

CLEVELAND, OHIO, U. S. A.,

Sole manufacturers of the

"BROWN HOIST"

A NEW AND COMPLETE SYSTEM FOR HANDLING OF MATERIALS.

The Brown Patent Cable Tramway system.

The Brown Patent Suspended Beam Tramway system.

The Brown Patent Bridge Tramway system.

The Brown Patent Shed Tramway system.

The Brown Patent Furnace Stock Distributer.

The Brown Patent Warehouse Tramway system.

The Brown Patent Sewer Machine Tramway system.

The Brown Patent Continuous Elevated Tramway system.

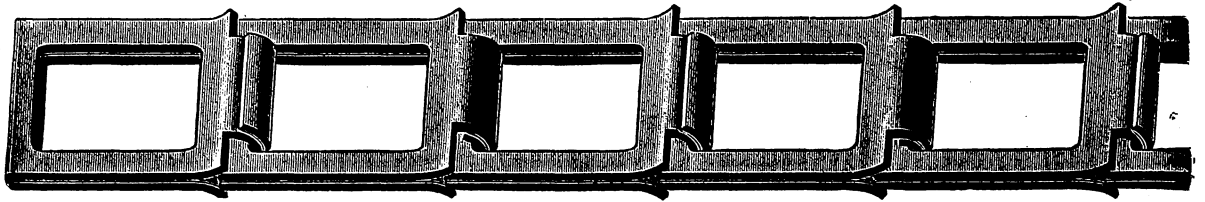
The Fayette-Brown Patent Automatic Furnace Hoist.

The Brown Patent Friction Clutch Hoisting Engine.

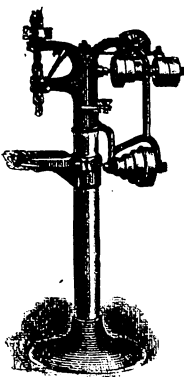
Self-Dumping Buckets, Skip Cars, Friction Clutches, etc.

The Most Perfect Clutch.

ROBERTS MFG. CO. - - - PITTSBURGH, PA.



PATENT DETACHABLE STEEL LINK BELTING,
Sprocket Wheels and Shafting. Send for Catalogue and reduced Price-List



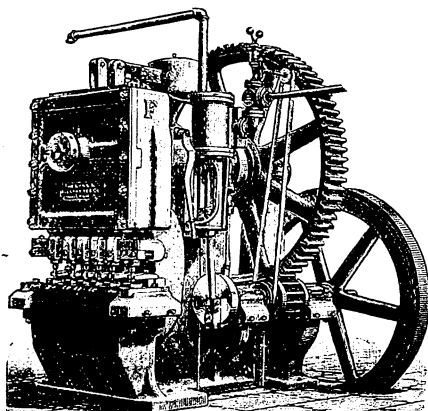
The Norton Drills

for light, sensitive and rapid drilling. 1, 2, 3, 4 or more spindles, sensitive or automatic feed. To drill from 0 to 1/4-inch holes. The latest and best. Most convenient, sensitive and durable drills on the market. Have balanced spindles and balanced tables. Write for prices and description, or for special machinery.

THE
NORTON & JONES MACHINE TOOL WORKS,
PLAINVILLE, CONN.

ALEXANDER BROS. BEST OAK BELTING. PHILADELPHIA.

Patterson, Gottfried & Hunter, Limited, agents,
146-150 Centre St., New York, N. Y.



SPLICE BAR PUNCH.

THE LONG & ALLSTATTER CO.,
HAMILTON, OHIO, U. S. A.
MANUFACTURERS OF
Belt, Steam and Electrically Driven
Power Punches and Shears.

JEFFREY CHAIN BELTING.

Also MALLEABLE, WROUGHT, STEEL AND SPECIAL CHAINS for

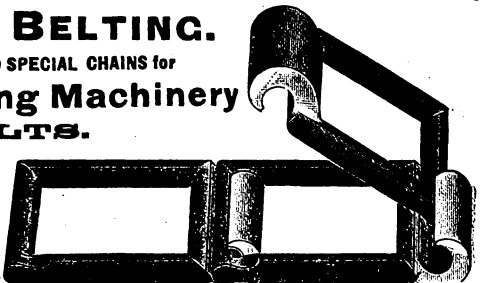
**Elevating and Conveying Machinery
DRIVE BELTS.**

Send for Illustrated Catalogue and Reduced Price-List.

THE JEFFREY MANUFACTURING CO.

COLUMBUS, OHIO, U. S. A.

New York Branch, 163 Washington St.



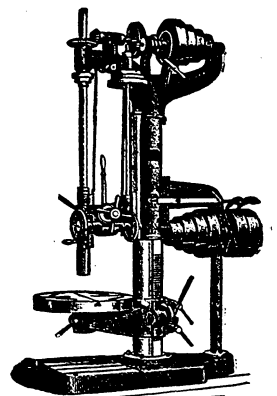
The Quality

That's what the machinery user who wants good work done and good tools to do it with is looking for. You get it from

THE HAMILTON MACHINE TOOL COMPANY,

WEST MARKET STREET,

Hamilton, - Ohio, U. S. A.



Jack Chain Machines.

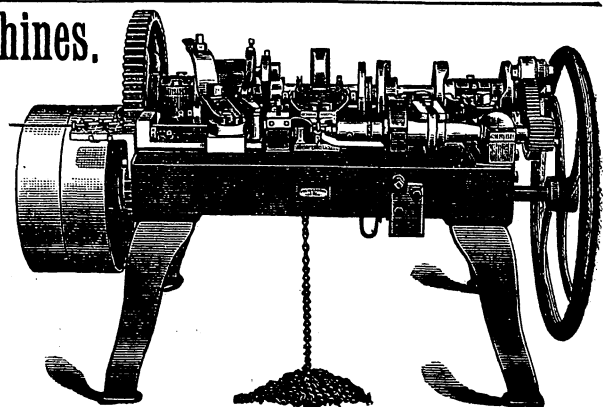
FOR BOTH DOUBLE AND SINGLE LINKS.

Entirely automatic, taking the wire directly from the coil and completing chain at the rate of 120 links per minute.

Send for prices.

CROSS & SPIERS MACHINE CO.,

Waterbury, Conn.



Pennsylvania Diamond Drill & Manufacturing Co.
BIRDSBORO, PA.

Drill Press and Planer Chucks. Steam and Gas Engines. Diamond Pointed Core Prospecting Drills. Boiler Fronts and General Castings. Mineral Lands Prospected and Artesian Wells Bored by Contract.

CHICAGO MACHINERY & ENGINEERING CO., Western Sales Agents, Chicago, Ill.

NEW YORK BELTING & PACKING CO. LTD

JOHN H. CHEEVER,
President.

15 Park Row, New York.

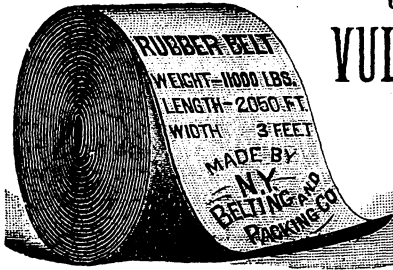
Oldest and Largest Manufacturers in the U. S. of

VULCANIZED RUBBER FABRICS

For Mechanical Purposes.

MACHINE BELTING

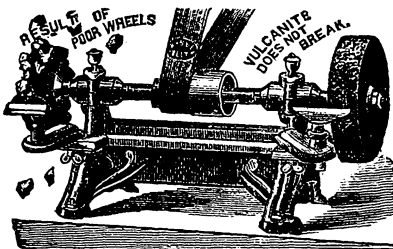
With Smooth Metallic Rubber Surface.



RUBBER TEST HOSE

COTTON "CABLE" HOSE, CIRCULAR, WOVEN, SEAMLESS ANTISEPTIC

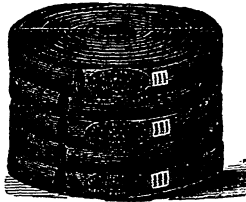
For the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories and Steamers.



Rubber Cement.

THE ORIGINAL SOLID VULCANITE EMERY WHEELS.

RUN EASY and SAFE, COOL and TRUE. ARE MORE DURABLE—HENCE CHEAPER. A trial will convince you of this. KNIFE GRINDING WHEELS; A SPECIALTY.



Rubber Goods to Order for all Mechanical Purposes.

SALESROOMS:

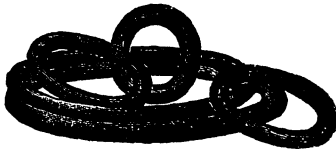
PHILADELPHIA, 308 Chestnut St.
BOSTON, 44 Summer St.
CHICAGO, 151 Lake St.
DENVER, 1601-1611 17th St.
CHARLESTON, 160 Meeting St.
CINCINNATI, 227 West 4th St.
MINNEAPOLIS, 200 1st Ave. South.
CLEVELAND, 176 Superior St.

SALESROOMS:

SAN FRANCISCO, 17 Main St.
DETROIT, 16-20 Woodward Ave.
BALTIMORE, 12 N. Charles St.
NEW ORLEANS, 8-12 N. Peters St.
KANSAS CITY, 1311 and 1313 W. 12th St.
ST. LOUIS, 618 Locust St.
DALLAS, 173 Elm St.

H. O. CANFIELD,

MOULDED BRIDGEPORT, CONN.



RUBBER GOODS Small moulded work a specialty. Send for estimates for moulds and work.
FOR MECHANICAL PURPOSES.

Smoke Stacks

— AND —

Boiler Fronts

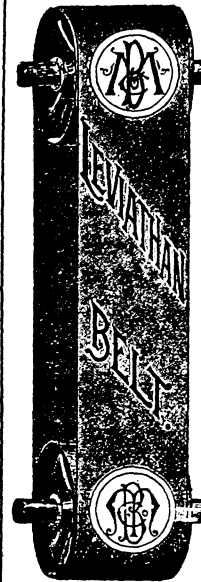
When painted with Dixon's Silica-Graphite Paint will resist the action of salt air, sulphurous vapors, etc., and give entire satisfaction.

So say those who have used it for many years. Send for circulars to

JOS DIXON CRUCIBLE CO.,
JERSEY CITY, N. J.

c

LEVIATHAN BELTING.



Positively unequalled for Strength, Durability and Traction Power; unaffected by Heat, Steam or Water.

Belts for Main Driving and work of a heavy nature a specialty.

MAIN BELTING COMPANY,

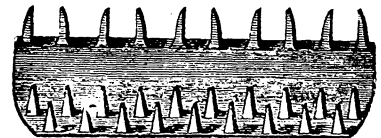
Sole Manufacturers,
1219-1235 Carpenter St.,
PHILADELPHIA.

248 Randolph Street, Chicago.

120 Pearl Street, Boston.

Send for Price-Lists and Samples.

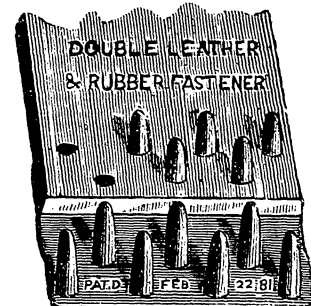
Talcott's Clinching Belt Hooks.



W. O. TALCOTT, Providence, R. I.
MANUFACTURER OF

Four Styles of BELT HOOKS, Including 134 Sizes.
SEND FOR CATALOGUE.

Thacher's Patent BELT FASTENERS.



Manufactured by The Claffen Manufacturing Co.
Cleveland, O. Office, 71 and 73 Ontario St.

FOR THE "Double Triple Quick Stroke"

SHAPER

WRITE TO

GOULD & EBERHARDT, Newark, N.J.



12 in., 16 in., 20 in., 24 in., 28 in., 30 in. strokes.

E. W. BLISS CO.,

11 ADAMS STREET,
BROOKLYN, N. Y.

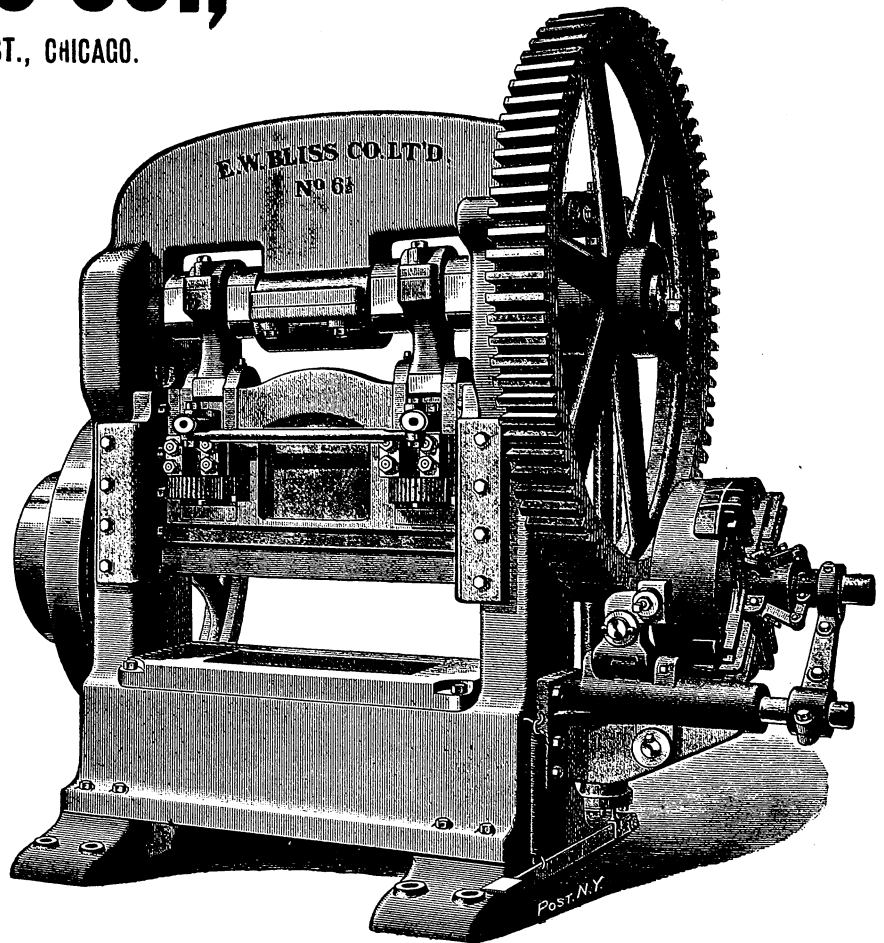
WESTERN OFFICE, 14 N. CANAL ST., CHICAGO.

These Presses are largely used in the manufacture of Sheet Iron and Steel Goods, such as Vapor Stoves, Paneled Ceiling and Sidings for Buildings, Cornice Work, Etc. Also for punching holes in Tanks, Water Pipes, Gasometers, Kitchen Boilers, Etc.

**PRESSES,
PUNCHES,
SHEARS,
DIES,
DROP
HAMMERS
AND
SPECIAL
MACHINERY.**

OWNERS ALSO OF

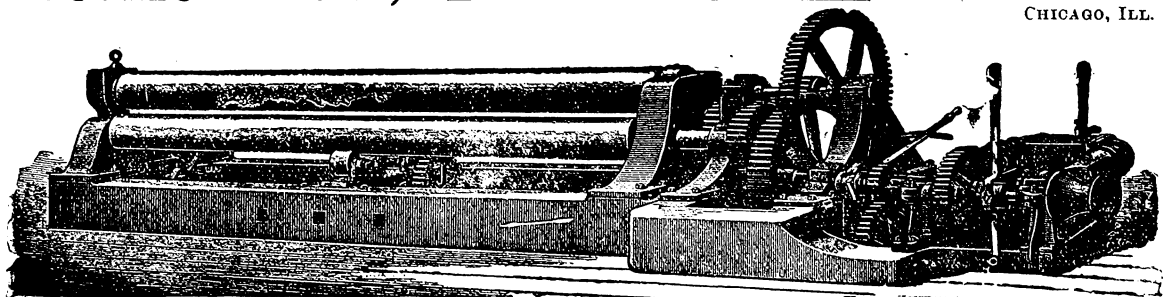
The Stiles & Parker Press Co.



Wickes Patent Plate Bending Rolls.

WICKES BROS., SAGINAW (E. S.), MICH.

And
510 MONADNOCK BLDG.,
CHICAGO, ILL.



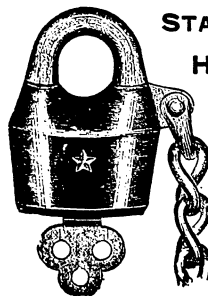
The Plates for the Famous McDougall Whale-Back Ships are shaped on Rolls of our Manufacture

REFERENCES:

AMERICAN STEEL BARGE CO.,	- - -	West Superior, Wis.	AMES IRON WORKS,	- - -	Oswego, N. Y.
ERIE CITY IRON WORKS,	- - -	Erie, Pa.	T. M. NAGEL,	- - -	Erie, Pa.
J. C. McNEIL CO.,	- - -	Akron, Ohio.	ROHAN BROS. BOILER MANUFACTURING CO,	- - -	St. Louis, Mo.

The Prospector's Field-Book and Guide in the Search for and the Easy Determination of Ores and other Useful Minerals. By Prof. H. S. OSBORN, LL.D. EXTRACT FROM THE PREFACE: In the following pages we have attempted to present such a view of the whole subject of prospecting for the useful minerals that any liberally educated reader may fully comprehend our meaning. We have therefore explained special terms where we have thought it convenient to use them, and where the technically educated student would not need an explanation. The table of contents and index have both been carefully prepared, and being very full, will make reference to any subject in the volume easy and satisfactory. 44 engravings. 175 pages \$1.50

For sale by David Williams, 96-102 Reade St., N. Y.



STAR LOCK WORKS, PHILA.

HILLEBRAND & WOLF,

MANUF'RS OF

1ST QUALITY ONLY

SCANDINAVIAN

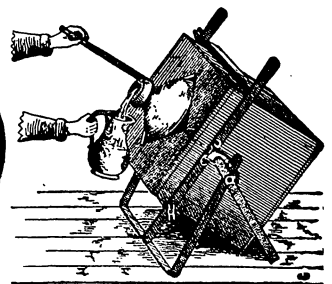
AND

SPRING PADLOCKS

TRUNK & CASE LOCKS

CARBOY STANDS, &C.

CATALOGUES SENT ON APPLICATION.



RIEHLE

BROS. TESTING MACHINE CO., Phila., have issued a new describing and illustrating all the various styles of their U. S. Standard Testing Machinery with the special appliances. Marble Machinery, Rope Twisters, Loam Mills, Riehle-Roble Frictionless Ball Screw Jacks, Iron and Wooden Trucks, &c., &c., are described. It is desired to have one of these Catalogues in the office of every Superintendent, Purchasing Agent, Engineer or Manufacturer using such Machinery. A copy will be mailed free of charge to those who may apply.

CAT. No. 3

LINK-BELT

ENGINEERING CO
NICETOWN,
PHILA
49 DEY ST.
NEW YORK

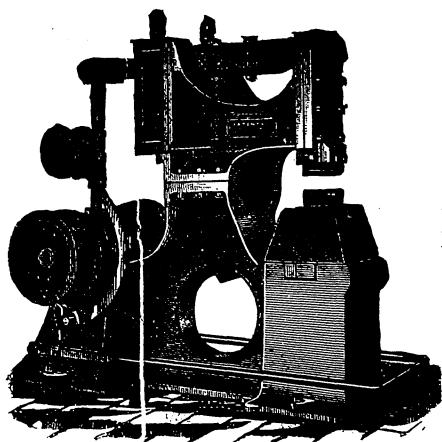
Elevators, Conveyors, Manila Rope Power Transmission Machinery, Ewart Detachable Link Belting Dodge Chain, Howe Chain, &c.

General Eastern Agents for Fibre-Graphite Journal Bearings for shafting and machines. Require no oil or other lubricant. Moderate in price, durable and guaranteed. Bearings furnished to fit hangers now in use.

WESTERN CONNECTION

[CHICAGO,] LINK BELT MACHINERY CO.

JENKINS' POWER HAMMERS.



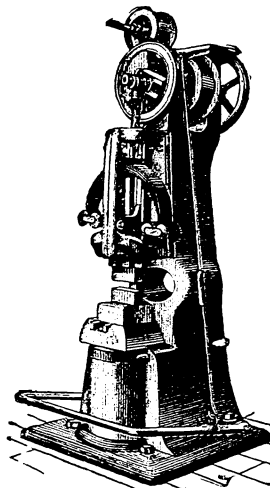
Adjustable and elastic stroke, nicety of regulation, efficiency of action, simplicity and durability of construction and the absence of leather straps, steel springs and all complication, combine to make this hammer the favorite wherever used.

JENKINS & LINGLE,
BELLEFONTE, PA.

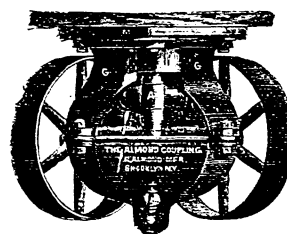
If You Use Power Hammers

Write to us for Circulars.

BELDEN MACHINE CO.
NEW HAVEN, CONN.



Chicago Office, 65 South Canal Street.



THIS CUT REPRESENTS
ALMOND'S PAT. QUARTER-TURN COUPLING
To Replace Mule Pulleys and Bevel Gears.

It is a noiseless quarter-turn countershaft, self-contained, perfectly lubricated, and gives no trouble. Send for particulars.

T. R. ALMOND, 83 and 85 Washington Street
Brooklyn, N. Y.

Presses, Dies, Presses, OF ALL KINDS FOR Sheet Metal Ware.

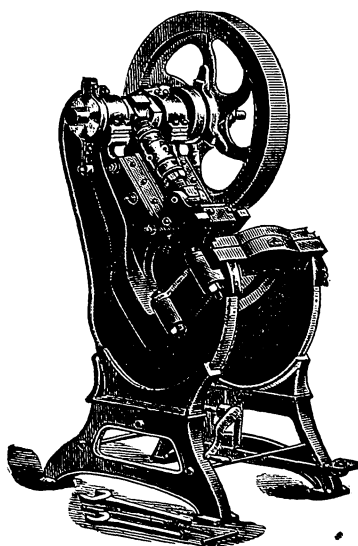
Difficult and Intricate Drawing
Stamping, Embossing, Wiring,
Blanking and Combination
Dies a Specialty.

SUBMIT SAMPLES AND WRITE FOR PRICES.

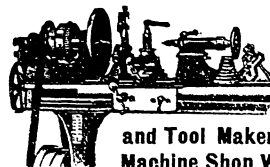
Stark Machine & Tool Co.,

BUFFALO, N. Y.

Send for Catalogue and mention "The Iron Age."



FOOT POWER LATHES,



For Electrical and Experimental work.
For Gunsmiths and Tool Makers. For General Machine Shop Work.

High grade tools; elegant in design, superior in construction. The best foot power lathes made, and quality considered the cheapest. Discounts to the Hardware and Machinery trade, quoted on application. Send for Catalogue and Price-List.

W. F. & JNO. BARNES CO.,
69 Ruby Street, ROCKFORD, ILL.
ENGLISH AGENTS, CHAS. CHURCHILL & CO.,
21 Cross St., Finsbury, E. C., London.

G. A. CROS
Manufacture
PRESSE
SPECIAL MA
SHEET METAL
176 178 So. Clinton

BY
rs of
S. DIES
CHINERY
WORKERS
Sr., Chicago, Ill.

THE VALLENTINE TOOL CO.,

223 State St., Hartford, Conn.

—MANUFACTURE—

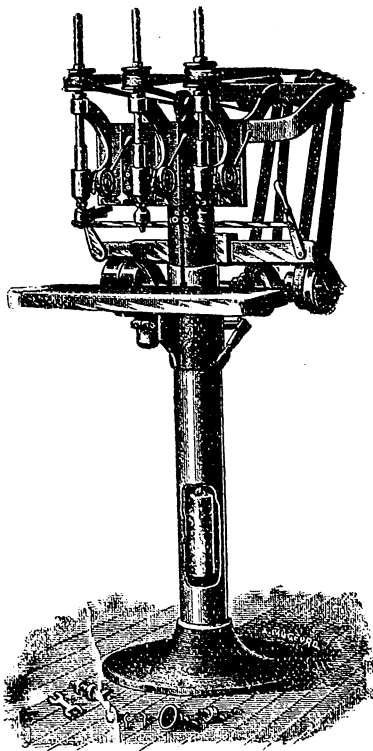
STEEL RULES, FLEXIBLE
and SPRING TEMPER.



SEND FOR LIST AND DISCOUNTS.

SIGOURNEY DRILLS.

IMPROVED.



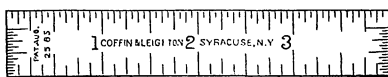
Sensitive Strong and Interchangeable

One, Two and Three Spindles.

Counter-balanced Spindles and Tables. Vertical range of table, 30 inches, and it will swing to right or left.

SEND FOR CIRCULAR.

THE SIGOURNEY TOOL CO.,
Hartford, Conn.



MACHINISTS' SCALES,
PATENT END GRADUATION.
Liberal Discount to the Trade. Send for List.

COFFIN & LEIGHTON, Syracuse, N. Y.

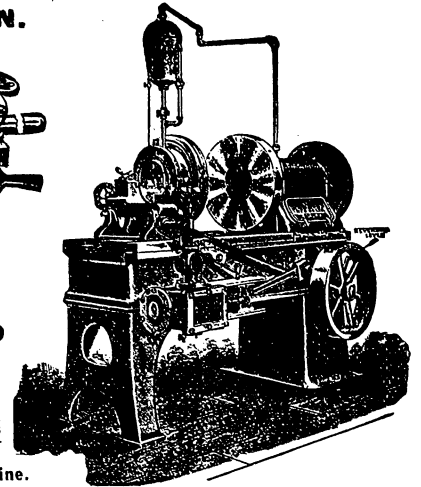
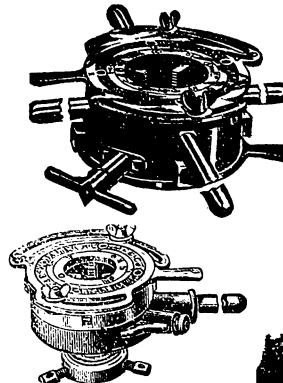
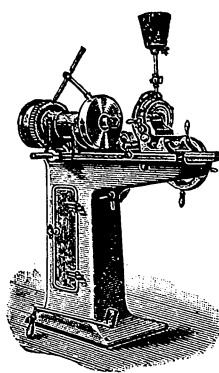
DRILL PRESSES
MFRS. OF
THE LARGEST
VARIETY
SEND FOR NEW
30 PAGE CATALOGUE
JUST OUT
DWIGHT SLATE
MACHINE CO. CONN.
HARTFORD



ARMSTRONG MFG. CO.
BRIDGEPORT, CONN.
OUR ADJUSTABLE STOCKS AND DIES are universally acknowledged to be the BEST! We also make all our Tools on the same principle of the Best Material and Workmanship, and always with a view of time and labor saving in their use.

JARECKI MFG. CO. (Limited), Erie, Pa.

PIPE THREADING AND CUTTING TOOLS OF ALL DESCRIPTION.



Write for Catalogue showing the most complete line of $\frac{1}{4}$ inch to 16 inch for hand, belt, engine and with electric motor attachment.

We can furnish Bolt Threading Attachment for this Machine.

IF YOU WANT ANYTHING IN THE LINE OF
DROP PRESSES • DROP HAMMERS •
STAMPS OR AUTOMATIC
DROP LIFTERS
SEND FOR CATALOGUE TO

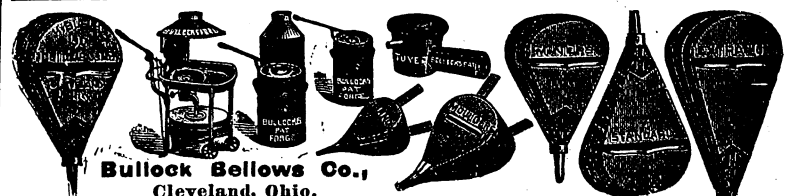
Miner & Peck Mfg. Co.
New Haven, Conn.
LARGEST LINE IN THE MARKET.

— HIGH GRADE — COMPOUND ENGINES.

For Steam Yachts, or any other Power. Require less boiler capacity, guaranteed to save one-third of fuel, simple, durable. Prompt delivery up to 150 H.-P.

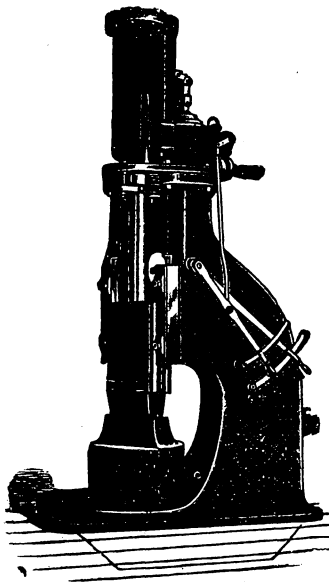
THE COULTER & MCKENZIE MACHINE CO.,
NORTH DEPOT. BRIDGEPORT, CONN.

COPELAND & BACON
HOISTING & WINDING ENGINES
ORE CRUSHERS, ORE WASHERS, CONCENTRATING MACHINERY, GRAVITY INCLINES, STONE CRUSHERS, RAILROAD CRANES.
85 LIBERTY ST., NEW YORK. 62 SO. CANAL ST., CHICAGO.



Bullock Bellows Co.,
Cleveland, Ohio.

Largest
Mfrs.
in the
World.



Bement, Miles & Co.,

PHILADELPHIA, PA.,
Builders of

Metal-Working Machine Tools

For railroad shops, locomotive and car builders,
machine shops, steam forges, shipyards, boiler
shops bridge works

**Steam Hammers for Working Iron
or Steel.**

NEW YORK OFFICE, Equitable Building.

GEORGE PLACE, Agent.

THE STURTEVANT STEEL PRESSURE BLOWERS

For Cupola Furnaces and Forges.

THE STURTEVANT SYSTEM

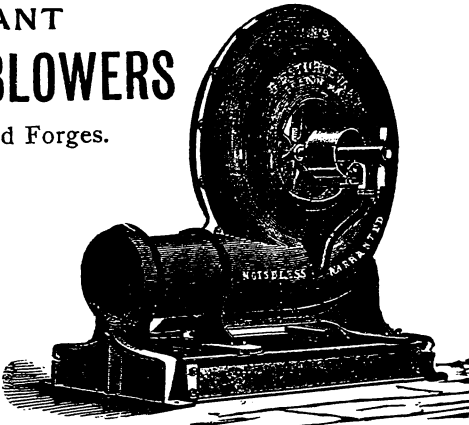
—OF—

Heating and Ventilating

MANUFACTURING ESTABLISHMENTS.

PORTABLE FORGES

SEND FOR CATALOGUES.



B. F. STURTEVANT CO.,

BOSTON, MASS.

BRANCHES: 91 Liberty St., New York. 16 So. Canal St., Chicago. 135 No. Third St., Philadelphia

PITTSBURGH MFG. CO.,

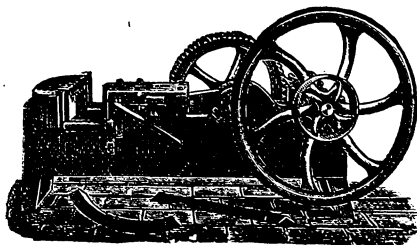
Manufacturers of

**Crosgrove's Patent Straight-
ening, Bending and Punch-
ing Machines.**

NAIL MACHINERY.

Bolts, Nuts, Rivets, Castings, &c.

PITTSBURGH, . . PA.



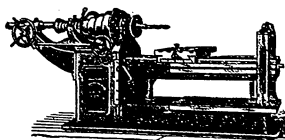
FITCHBURG MACHINE WORKS,

MANUFACTURERS OF THE CELEBRATED

FITCHBURG

AND OTHER

SEND FOR
CATALOGUE B.



Horizontal Boring and Drilling
Machine.

ENGINE LATHE

METAL-WORKING MACHINES.

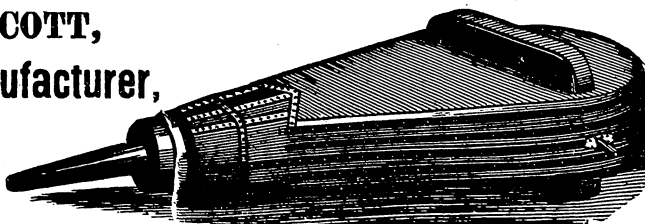
**FITCHBURG
MASS.**

GEO. M. SCOTT, Bellows Manufacturer,

Johnson Street

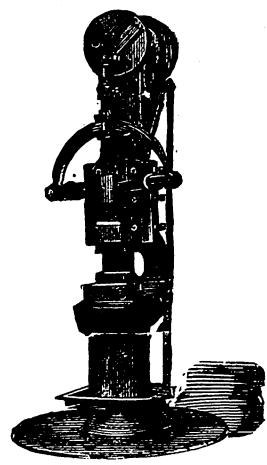
Cor. 22d St.,

CHICAGO, ILL.



DEAD-STROKE POWER HAMMERS

CONSTRUCTION IMPROVED.
Seven Sizes.
Prices Reduced.
5 to 250 Pounds.



The 15 and 25 pound sizes are specially adapted to
filmmakers' use, the other sizes for general forging.
Send for circular and references.

DIEBELT & EISENHARDT,

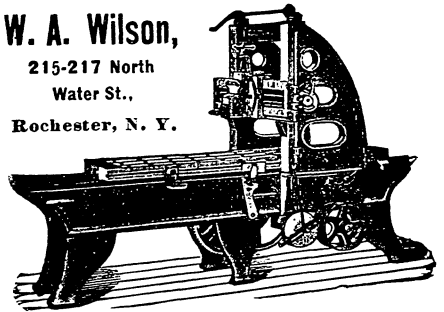
MAKERS,

1510 Howard St., Philadelphia.

W. A. Wilson,

215-217 North
Water St.,

Rochester, N. Y.



Improved Iron Planers a specialty. 20 x 20, 22 x 22
24 x 24 up to 42 x 42, to plane any length. Send for
description and price-list before purchasing. Manu-
facturers' agent for other tools and machinery. Men-
tion *The Iron Age*.

THE POWELL PLANER CO.

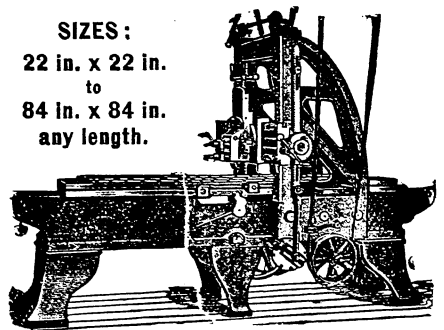
SIZES:

22 in. x 22 in.

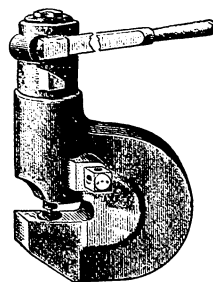
to

84 in. x 84 in.

any length.



WORCESTER, MASS.



A. L. HENDERER

Wilmington, Del.,

Manufacturer of

Hydraulic

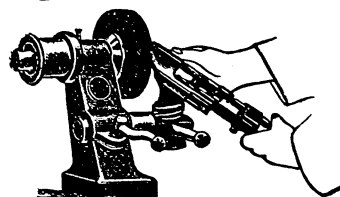
Punches,

Screw Punches,

Forged Steel Expanders, Flue Hole Cutters,
Boiler Test Pumps and
Pipe Vises.

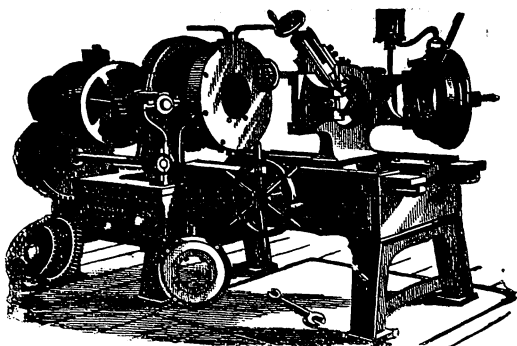
Price-lists and discounts
on application.

DRILL GRINDER.



THE WASHBURN SHOPS
WORCESTER, MASS.





D. SAUNDERS' SONS,

—MANUFACTURERS OF—

Pipe Cutting and Threading Machines

For Pipe-Mill and Steam Fitters Use. Tapping Machines for Steam Fitting. Also Steam and Gas Fitters' Hand Tools.

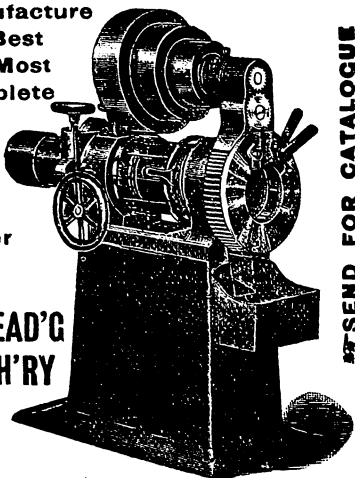
—SEND FOR CIRCULARS.—

No. 25 Atherton Street, - YONKERS, N. Y.

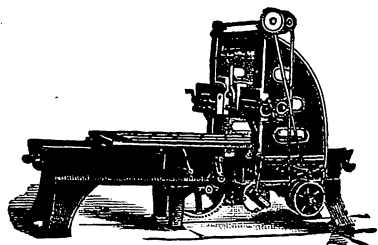
The Merrill Manufacturing Co.,
TOLEDO, O.

Manufacture
The Best
and Most
Complete
Line
of
Hand
and
Power

PIPE
THREAD'G
MACH'RY
IN
USE.



SEND FOR CATALOGUE



NEW HAVEN MANUFACTURING CO.
NEW HAVEN, CONN.,

Manufacturers of

IRON-WORKING MACHINERY

DUNHAM NUT MACHINE CO.,

Unionville, Conn.,

Manufacturers of

AUTOMATIC COLD PRESS NUT MACHINES
FOR MAKING CHAMFERED AND TRIMMED NUTS.

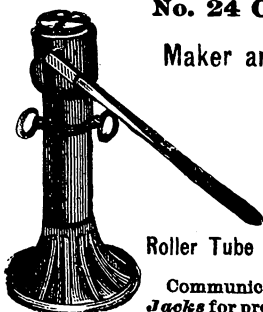
Correspondence Solicited.

RICHARD DUDGEON,

No. 24 Columbia Street, New York.

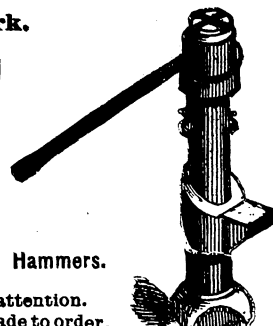
Maker and Patentee of the Improved

Hydraulic Jacks AND Punches.



Roller Tube Expanders and Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order.



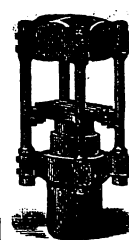
HYDRAULIC PRESSES and PUMPS FOR ALL PURPOSES.



Plain Press

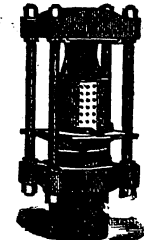
Baling Presses,
Oil Presses,
Embossing Presses,
Die Presses,
Belt Presses,
Frame Benders,
Riveting Presses,
And all other Presses.

WATSON & STILLMAN



Forging Press

Hand Pumps,
Belt Pumps,
Steam Pumps,
Automatic Pumps,
Variable Delivery
Pumps,
And over 50 varieties
of Hydraulic Pumps.
Accumulators, Valves,
Gauges, Fittings, &c.
204-210 East 43d
St., N. Y.



Curb Press.

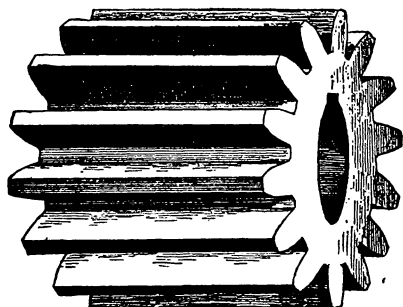
A Treatise on Belts and Pulleys.

Embracing full explanations of Fundamental Principles; proper Disposition of Pulleys; Rules for determining widths of leather and vulcanized rubber belts, and belts running over covered pulleys; Strength and Proportions of Pulleys, Drums, &c. Together with the principles and necessary rules for Rope Gearing and transmission of power by means of Metallic Cables. By J. Howard Cromwell, Ph. B., author of a Treatise on Toothed Gearing. 12mo, cloth. \$1.50.

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade St., N. Y.

HYDRAULIC FORGING.



Patent Hot Pressed Gear. Made from
Solid Billet. Accurate to Size. No
Cutting of Teeth Required.

Steel Bottles, Air and Gas Receivers drawn from
Solid Steel or Plates, Crank Shafts, Straps,
Wrists, Pins, Irregular Shapes, Discs,
Cups, Boiler Heads, Steel Flanges for
High Pressure Steam, Drawn Steel
Tubing for Bicycles, Boilers, Etc.

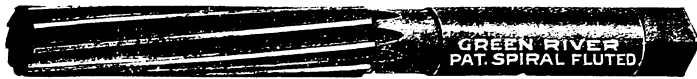
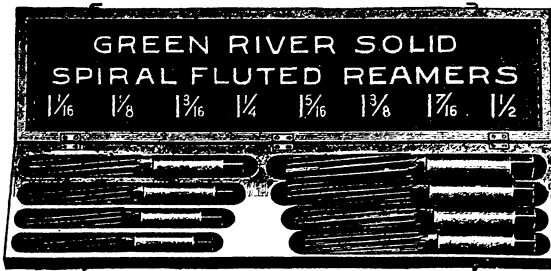
THE UNITED STATES PROJECTILE CO.,

1st Avenue and 53d St., Brooklyn, N. Y.

CORRESPONDENCE SOLICITED.

GREEN RIVER PAT. SPIRAL FLUTED REAMERS.

Hand, Chucking and Taper. Solid and Shell. Finest Made.
Send for Catalogue.



MANUFACTURED BY

Wiley & Russell Mfg. Co., Greenfield, Mass., U. S. A.

New York Agency for Wiley & Russell, 114 Liberty St.

Don't Buy

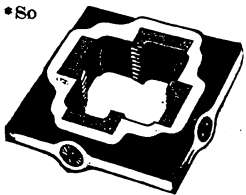
**Maule's "Skeleton" Pipe Die*

If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;
Of **surpassing durability** secured by the accurate and uniform temper of said Cutters;
Having Cutters that when dull may be removed in a moment, and sharpened on a **grindstone or emery wheel**;
Of **phenomenal cheapness**, arising from **small first cost** coupled to **excellence of quality**.

*If by chance you **do not** think these points, or the saving of money, objectionable,*

*So

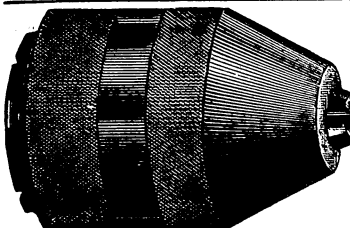


Send us a Postal Note for 62 Cents (do not send us any postage stamps), and we will mail you a sample **one-inch Die**, either $2\frac{3}{8}$ or $2\frac{1}{2} \times \frac{3}{4}$ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, U. S. A.

Send for Catalogue of the "Skeleton" Pipe Die.

Wire Drawing Machines, **WATERBURY**
Gang Slitters, **MACHINE CO.,**
Power Presses and Dies, Waterbury, Conn.
Tumbling Barrels, **MANUFACTURERS.**
Special Machinery. **Send For Prices.**



THE NEW GIANT DRILL CHUCK.

Holds a Drill With the Grip of a Giant. All Steel
Parts Interchangeable.

SIMPLE IN CONSTRUCTION.

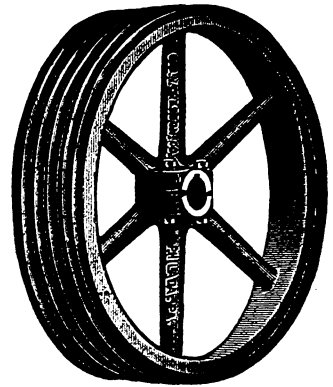
EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY-CHEAP. Manufactured and sold by

THE SMITH & EGGE MFG. CO., Bridgeport, Conn.

GEO. V. CRESSON CO.,

18th STREET AND ALLEGHENY AVE.

PHILADELPHIA, PA.

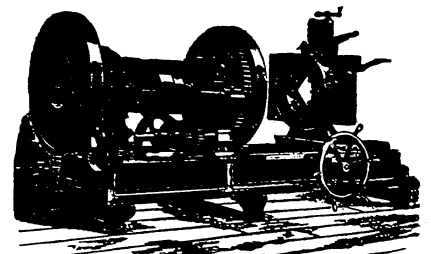
**ROPE WHEELS,**

All Diameters and Number of Grooves, for Manilla, Hemp, Cotton, or Leather Ropes.



A. H. MERRIMAN,
MERRIDEN, CONN.,
Manufacturer of all Descriptions of

PRESSES.



BIGNALL & KEELER MFG. CO., St. Louis, MO.

MANUFACTURERS OF
Peerless Duplex Pipe Cutting and Threading Machines. Send for Catalogue.

Our Prices are Low and our Goods are the Best.

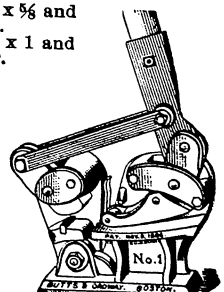
B. & O. TIRE UPSETTER.
SURE GRIP.

No. 1, Upsets $3 \times \frac{9}{8}$ and smaller.
No. 2, Upsets 4×1 and smaller.

IT IS WITHOUT A FAULT. ONE MOTION DOES IT ALL.

Every machine is tested and warranted to give satisfaction. We confidently offer this Upsetter as the best to be had. Send for Price.

BUTTS & ORDWAY,
500 Atlantic Ave.,
BOSTON, MASS.



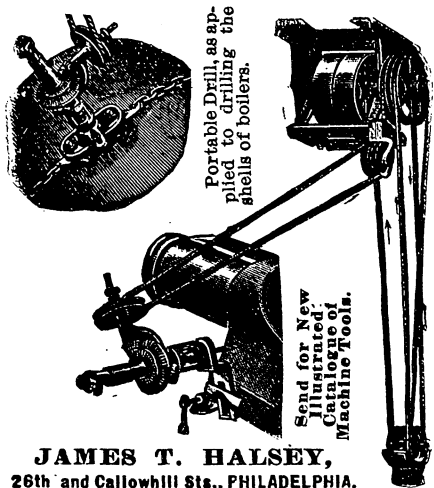
FRICITION CLUTCHES, SHAFTING, HANGERS, PULLEYS.

Sheaves for Rope Driving.
Gear Wheels.

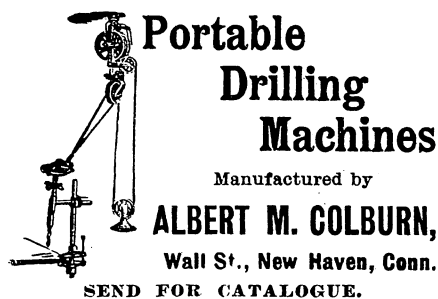
FRICITION PULLEYS.

KEYSTONE CLUTCH AND MACHINE WORKS,

1708-1710 Germantown Ave.,
PHILADELPHIA, PA.



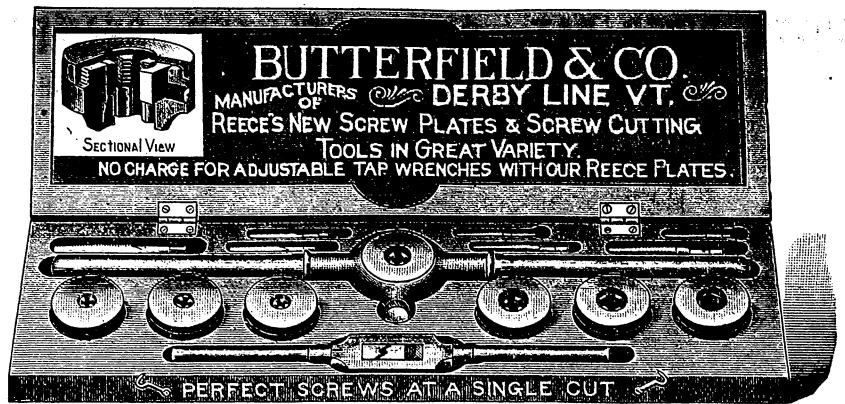
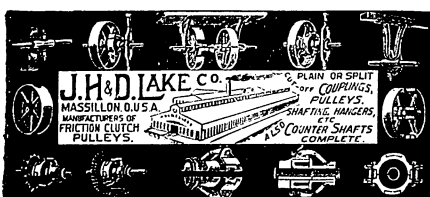
JAMES T. HALSEY,
26th and Callowhill Sts., PHILADELPHIA.



REECE'S PATENT HAND BOLT CUTTER
OR SCREW PLATE.



Send for new catalogue of
SCREW CUTTING TOOLS.
EDWARD F. REECE, Mfr., GREENFIELD, MASS.



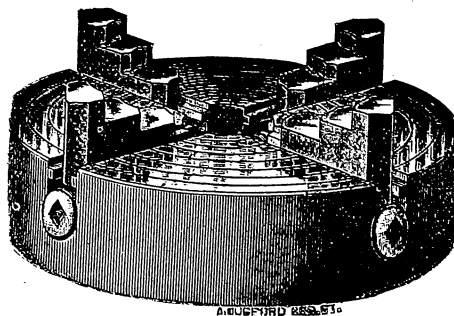
CUSHMAN CHUCKS.

We have recently improved our full line of Geared Scroll Chucks and have also added a 10½ inch and a 15 inch. Prices and discount on application.

Send for our catalogue of all kinds of Lathe and Drill Chucks.

The Cushman Chuck Co.,
Hartford, Conn.

CHAMPION INDEPENDENT CHUCKS.



An entirely new line of small Chucks, provided with 3 or 4 independent reversible steel jaws. The best Chuck in the market for foot lathes. Ask your dealer for them or write to us.

THE D. E. WHITON MACHINE CO.
Sole European Agents 'SELIG SONNENTHAL & CO., London. New London, Conn.



Three styles of Screw Plates **BUILT ENTIRELY ON HONOR**, with prices to suit all. Write for catalogue.

CHAMPION BLOWER & FORGE CO., - - LANCASTER, PA.



Wells Bros. & Co., Greenfield, Mass., U.S.A.

MANUFACTURERS OF

Labor-Saving Tools and Machinery.

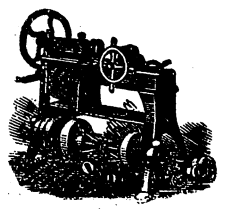


Screw Plates, cutting all sizes

"LITTLE GIANT"

Upsetters, Tire Benders, Foot Vises,
Drilling Machines, Tire Wheels, &c., &c.

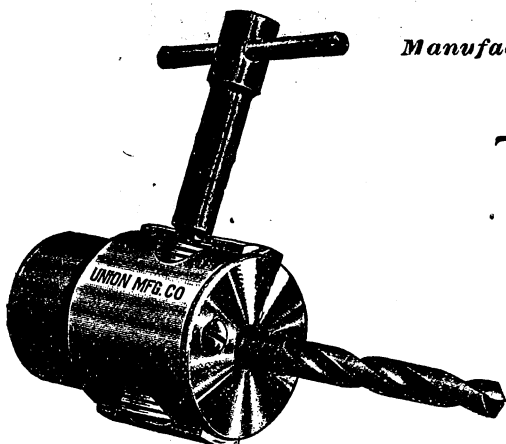
Send for our 1893 Catalogue of 62 pages.



UNION MANUFACTURING COMPANY, .'. NEW BRITAIN, CONN.

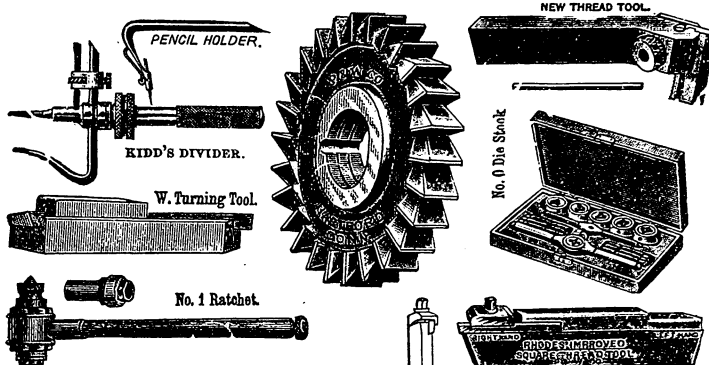
WAREHOUSE, 103 CHAMBERS ST., NEW YORK.

Manufacturers of Combination, Universal, Independent, and Combination Reversible Jaw Chucks.



THE UNION DRILL CHUCK.

NUMBER.	DIAMETER.	HOLDING.	LIST.
000	1 1/4 inches.	0 to 1/4 inch.	\$7.00
100	2 1/4 "	0 to 1/2 inch.	8.00
101	2 3/4 "	0 to 3/4 inch.	9 00
102	3 1/2 "	0 to 1 inch.	10 00



Milling Cutters, Reamers, Taps,

Dies, Gauges, Boiler Plate Punches, Tools for Turning, Threading, Forming and Cutting-off will cost the user more, and the quality will not be as good, if made by one having only limited facilities for such work, than if they are purchased of PRATT & WHITNEY Co., Hartford, Conn., U. S. A., Manufacturer of such goods in large quantity and great variety.

Ask for "Hardware Catalogue."

HENDRICKS' ARCHITECTS AND BUILDERS' GUIDE

—:AND:—

CONTRACTORS' DIRECTORY OF AMERICA

—:FOR:—

BUILDERS, CONTRACTORS, MANUFACTURERS AND DEALERS IN ALL KINDS OF BUILDING SUPPLIES.

A Complete Directory of all the Construction Industries of the Country, containing over 170,000 Names. Addresses and Business Classifications, comprising Builders and Contractors of Material and Construction in the Building and kindred Industries. With Full lists of the Manufacturers of and Dealers in Everything employed in the Manufacture of Material and Apparatus used in these Industries—from the Raw Material to the Manufactured Article, and from the Producer to the Consumer.

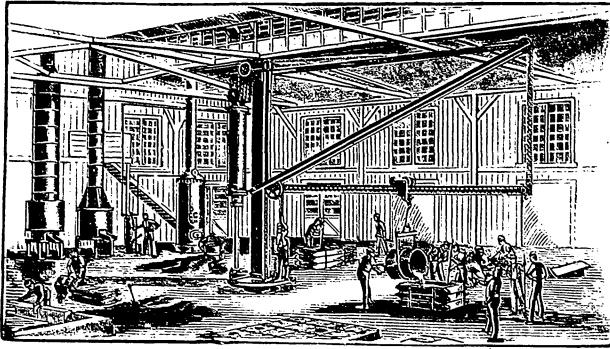
Architects; Arch'l Wood Workers; Car Builders; Carpenters; Builders and Contractors of all kinds; Blast Furnaces; Brick Mfrs. (Common, Fire, Ornamental, Paving, Pressed, &c.); Boiler Mfrs.; Bridge Builders; Builders' Hardware; Mfrs. of Building Iron of all kinds; Cement; Cornices; Dumb Waiters; Engine Mfrs.; Engine and Boiler Dealers; Electric Lighting Co.'s Dynamos and Motors; Elevators; Engineers (Civil and Mechanical); Electricians; Fire Escapes; Furnaces; Fire Proof Building Material; Dredging Machinery and Contractors; Dock Builders; Contractors for Railroads (Steam, Electric, Elevated, Cable, Street, &c.); Granite Producers, Dealers and Workers; Granite and Marble Monument Workers and Dealers; Iron and Steel Ceiling and Siding; Iron and Steel Roofing; Lathing (Iron, Steel and Wire); Lightning Rods; Mantel Mfrs. (Iron Marble, Onyx, Slate, Wood, &c.); Mantels, Grates, Fenders, Tile, &c.; Marble Producers, Marble Dealers and Workers; Mason and Builders' Materials; Paint Mfrs.; Paint, Oil and Glass Dealers; Plumbers' Specialties; Plumbers, Gas and Steam Fitters; Plumbers' Gas and Steam Fitters' Supplies; Roofers and Roofers' Supplies; Steam Supplies (Gauges, Feed Water Heaters, Traps, Valves, Pipe and Boiler Coverings, Cast and Wrought Iron Pipe and Fittings); Steam and Hot Water Heating Apparatus; House Heating Boilers and Heaters; Steam and Hot Water Heating Contractors; Railroad Purchasing Officials; Radiators; Rolling Mills, &c.; Sashes, Doors and Blinds; Skylights; Stone Dealers; Terra Cotta; Varnishes; Ventilators; Vault and Sidewalk Lights; Weather Vanes; White Lead Mfrs.; Wire Mfrs. and Workers; in fact everything connected with the Building Industries.

FOR THE YEARS 1893-94.

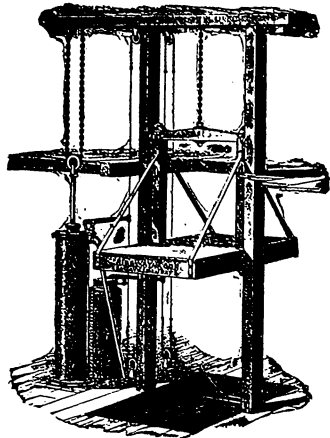
PRICE. FIVE DOLLARS.

SENT, POSTPAID, ON RECEIPT OF THE PRICE, BY

DAVID WILLIAMS, Publisher and Bookseller,
96-102 Reade Street, N. Y.



5-ton Ridgway Crane in Foundry Diamond State Iron Co., Wilmington, Del.



Steam-Hydraulic Elevator.
is the Crane for all places.

Give full particulars and get circulars and prices.

CRAIG RIDGWAY & SON, Coatesville, Pa.

**SAFE,
RAPID,
SURE**
—AND—
Not Costly.

The Crane that is perfection for the exacting requirements of a Foundry

Ridgway Balanced Steam-Hydraulic Crane.

The Greatest Foundry Crane Known.

Another Big Foundry Adopts It.

The large, handsome and most modern foundry of the country now being erected by the J. I. Case Co. at Racine, Wis., will be equipped with only the latest and best labor saving machinery to be had.

The Cranes used, of course, will be the Ridgway Steam-Hydraulic. The order for these and a lot of our patent one ton air hoists has been placed with us.

When the best money making establishments in the country are adopting, in this way, the Ridgway Crane, what more need be said?

Read what the finest foundry in Chicago says:

**FRASER & CHALMERS,
Mining Machinery.**

CHICAGO, ILL., April 11, 1893.

**MESSRS. CRAIG, RIDGWAY & SON,
Coatesville, Pa.**

Dear Sirs:—Replying to your favor of the 6th, asking whether the Steam-Hydraulic Crane furnished for our new foundry at 12th and Rockwell Streets has been satisfactory or not, we beg to say that we have found the Crane highly satisfactory in every respect. We consider it the best Crane made to-day for general foundry use and it is also well adapted for other uses. We should be glad to have you refer anybody to us who may wish to hear directly from us as to our opinion of the Crane. Yours truly,

FRASER & CHALMERS, C. E. Billin, Supt.

SELL THE BEST.



**THE "SURE GRIP"
Steel Tackle Block**
is taking the place of all other hoisting blocks.

Send for catalogue and discount

**Fulton Iron & Engine Works,
28 Brush St., Detroit, Mich.
ESTABLISHED 1852.**


**WOOD-WORKING
MACHINERY**
OF EVERY DESCRIPTION.
J. A. FAY & EGAN CO.
179 to 199 W. Front Street,
CINCINNATI, OHIO, U. S. A.



Our line is the largest in the world, comprising nearly 1000 different machines. Our plant is the largest in the world comprising nearly 11 acres of working surface. Our catalogues are the finest ever issued by a machinery concern.

OWNERS AND OPERATORS OF
J. A. FAY & CO. THE EGAN CO.

Highest Efficiency.



**WESTON'S NEW
TRIPLEX
Chain Block**
far exceeds all predecessors. Send for Prof. Thurston's report of comparative tests of all chain pulley blocks.

**The Yale & Towne Mfg. Co.
STAMFORD, CONN.**
New York, 84-86 Chambers St.
Chicago, 152-154 Wabash Ave.
Philadelphia, 1120 Market St.
Boston, 224 Franklin St.

LATHES.

ISRAEL H. JOHNSON, JR., & CO., - PHILADELPHIA.

Foot & Hand Power Machinery.
Screw Cutting Lathes, Wood Turning Lathes, Scroll Saws, Circular Saws, Moulders, Mortisers, Etc.
Strictly High Grade. Catalogue Free.
SENECA FALLS MFG. CO.,
255 Water St., Seneca Falls, N. Y., U. S. A.
London Agency, MESSRS. CHAS. CHURCHILL & Co., 21 Cross St., Finsbury, London, E. C., England.

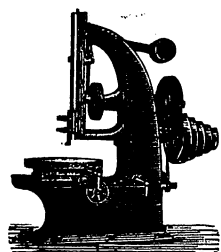



**MULTIPLE,
UPRIGHT, UNIVERSAL,
AND RADIAL
BORING AND TURNING MILLS.**
BICKFORD DRILL AND TOOL CO.,
10 Lawrence St., Cincinnati, O.



DRILLS

Why Band Saws Break. Sixteen reasons and how to avoid them. Being instructions to filers on the care of large band-saw blades used in the manufacture of lumber. By JOSHUA OLDHAM. 90 pages, illustrated, cloth. \$1.00
For sale by DAVID WILLIAMS, 96-102 Reade st., N.Y.



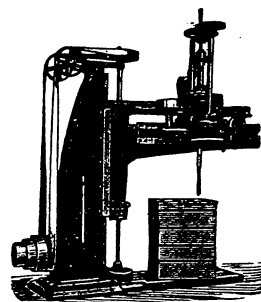
William Sellers & Co., Incorp.

PHILADELPHIA, PA.,

—MANUFACTURERS OF—

Improved Machine Tools for Working Iron and Steel,
High Speed Power Traveling and Swing Cranes,
Injectors, Locomotive Turn Tables, Shafting, &c., &c.
Testing Machines, under patents of A. H. Emery.

Prices, Descriptive Matter, &c., Furnished on Application.



**MORSE,
WILLIAMS
& CO.**

Morse Elevator Works.

MANUFACTURERS AND BUILDERS OF
ELECTRIC, HYDRAULIC, BELT and HAND
POWER PASSENGER and FREIGHT
ELEVATORS.

1105 Frankford Ave., Philadelphia. 108 Liberty St., New York
1116 E. St., N. W., Washington, D.C. 33 Lincoln St., Boston.
425 Spruce St., Scranton, Pa. 82 Church St., New Haven
Omaha Building, Chicago, Ill.



J. G. SPEIDEL,
807 & 809 CHERRY STREET,
READING, PA.
Patentee and Manufacturer of the
celebrated

Economic Safety Hoist.

500 to 30,000 Lbs. Capacity.
Has been awarded the John Scott
Medal and Premium by the Franklin
Institute of the City of Philadelphia
for Highest Efficiency, Sim-
plicity and Durability.

One man can lift two to three times
as fast as with any other self-holding
chain hoist. It has two speeds, is
built strong and durable, and guaran-
teed to give satisfaction.

TRAVELING AND SWING CRANES up
to 30,000 lbs. capacity and 50 ft. span.
Overhead Tramway, with Trolleys,
Switches, &c. Elevators and
Special Hoisting Machinery.
Illustrated Cat. and Prices on
application.

FAIRMOUNT MACHINE CO.,

(Successors to Thomas Wood & Co.)

Twenty-second and Wood Sts., Philadelphia, Pa.

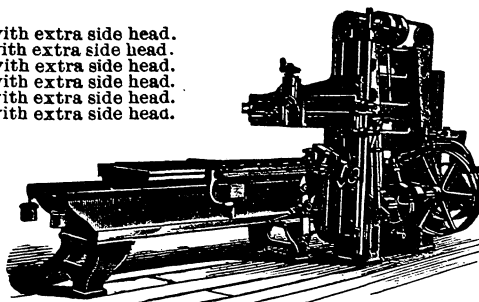
Shafting, Gearing, Self-Oiling Bearings, Friction Pul-
leys, Elevators.

Rope Transmission; Sheave Wheels, any size required, for Hemp, Manila and Cot-
ton Rope Driving. Looms, Cotton and Woolen Machinery for Winding,
Spooling, Reeling, Beaming, Warping, Dyeing, Sizing, Scouring &c.

= = OPEN-SIDE PLANERS. = =

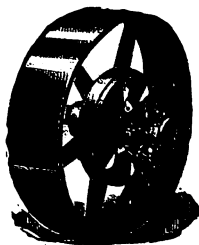
READY FOR IMMEDIATE AND PROMPT DELIVERY.

Size C (30 in. x 30 in.), to plane 6 feet long.
Size C (30 in. x 30 in.), to plane 8 feet long with extra side head.
Size C (30 in. x 30 in.), to plane 12 feet long with extra side head.
Size D (36 in. x 36 in.), to plane 10 feet long with extra side head.
Size D (36 in. x 36 in.), to plane 12 feet long with extra side head.
Size F (48 in. x 48 in.), to plane 14 feet long with extra side head.
Size F (48 in. x 48 in.), to plane 16 feet long with extra side head.



**DETRICK & HARVEY
MACHINE CO.,**
MANUFACTURERS,
BALTIMORE, - - MD.

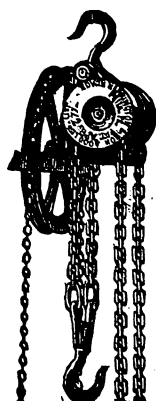
The Moore & White Co.,



Clutch Pulley.

N. E. Cor. 15th AND LEHIGH AVE.,
PHILADELPHIA, PA.

Paper
Machinery,
Friction
Clutches, &c



ESTABLISHED 1867.

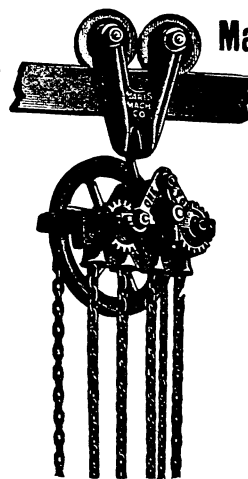
**E. Harrington, Son
& Co., Incorporated.**

Works and office:

1508 Pennsylvania Ave.,
Philadelphia, Pa.

Lathes, Planers, Drill
Presses, &c. Patent Double
Chain Screw Hoists, Over-
head Tramway-Switch, &c.

Gear Cutting a Specialty.



**Maris & Beekley,
PHILA., PA.**

MANUFACTURERS OF

CRANES,

Power Bridge
Cranes, Hand
Bridge Cranes,
Jib Cranes.

Portable Hoist.
Holds load at any
point.

Overhead Track,
Trolleys,
Switches.



Moore Mfg. & Fdry. Co.,

Milwaukee, Wis., U. S. A.,

Manufacturers of

Moore's Anti-Friction

Differential

Chain

Pulley

Block.

A New Movement!
A Perpetual Com-
pound Lever!
Powerful, Simple and
Durable!

One Man Can Lift to
the Full Capacity of the
Block.

Self-Sustaining at Any
Point.

The Block Always
Hangs Plumb.

Send for descriptive price-list,
mentioning this paper.

THE STANDARD TOOL CO., CLEVELAND, OHIO.

MANUFACTURERS OF

Increase Twist Drills, Reamers, Taps, Milling Cutters and Chucks.

Taper Shank
Drills,
St. Shank Drills,
Screw-driver
Bits,
Reamers,
Shell and Solid
Taper Reamers.



Bit Stock Drills for Metal or Wood.



Wood-Boring Brace Drills, will cut off nails.

Hand Taps,
Mach. Screw Taps
"Standard" Drill
Chuck,
"Ellenwood" Drill
Chuck,
Sq. Shank Drills
for Ratchets,
Twist Drills for
Blacksmiths'
Presses

Sockets for
Taper Shank
Drills.Reamers in
all sizes.

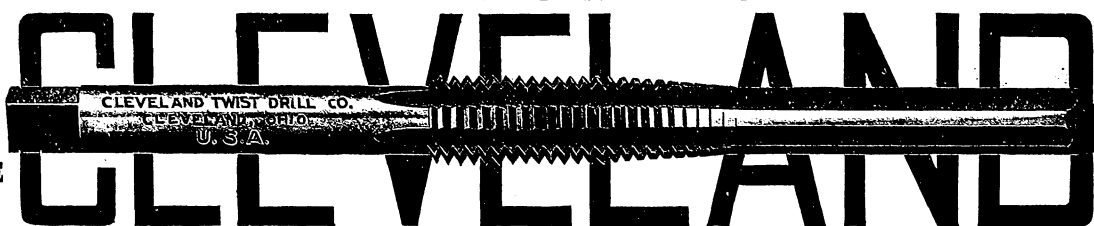
NEW YORK OFFICE, 33 CHAMBERS ST. Send for Catalogue.

1874

OLD RELIABLE.

1898

SEND
FOR
CATALOGUE



WRITE
FOR
DISCOUNTS

Our Drills are Hot Forged. The best part of the steel IS NOT CUT OUT and thrown away.



They are TOUGHER, STRONGER, BETTER than is possible to attain by milling. Catalogue and Discounts sent on application.

STOW FLEXIBLE SHAFT,

Invented and
Manufactured by
THE
STOW MFG. CO.,
Established 1875. Binghamton,
N. Y.
PORTABLE.
DRILLING
TAPPING.
REAMING.
General European Agents,
SELIG SONNENTHAL & CO.,
85 Queen Victoria St., LONDON, ENGLAND.

Thos. H. Dallett & Co.
York St. and Sedgley Ave..
PHILA.
MANUFACTURERS OF
Portable Drills, Hand
Drills, Boiler Shell Drills
Electric Motors specially
adapted for driving Ma-
chine Tools, Cranes, Ele-
vators, Pumps, Presses and
other machinery.
Complete Power and Light
Plants Installed.

Stow Flexible Shaft Co., Limited,

26th, Callowhill & Biddle Sts.
PHILA., PA.,
Manufacturers of
PORTABLE DRILLING,
TAPPING, REAMING
and BORING MACHINES
Also Tools for Emery Wheel
Grinding, Metal and Wood Pol-
ishing, Cattle Brushing and
Clipping, &c.
Gen'l European
Agents.
Bolling & Lowe,
2 Lawrence,
Pountney Hill.
LONDON, ENG.

Morse Twist Drill & Machine Co., NEW BEDFORD, MASS.

The hollow drill shown above is used for boring deep holes. It screws into the end of a pipe of such length as desired.

The three groove reamer is a rapid cutting and satisfactory tool for boring cored holes or enlarging a hole. Its six bearing surfaces make it accurate and prevent winding when blow holes are encountered.

MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers; also of Solid Bolt and Pipe Dies. Furnished in V. U. S. Standard and Whitworth shape of threads.

111 Liberty Street, NEW YORK.

FOR PIPE

THE ADJUSTABLE "DUPLEX" DIE STOCK.

Quick. Accurate. Durable.
15,000 now in use.

HART MANUFACTURING CO.,

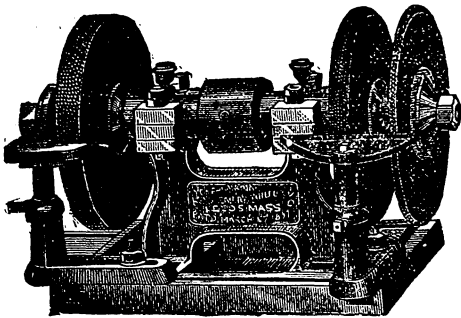
CLEVELAND, O., U. S. A.

SCREW CUTTING
MADE EASY
PERFECT THREADS AT ONE CUT
FOR BOLTS.

NORTON EMERY WHEEL COMPANY.

Illustrated CATALOGUE free upon application.

Over **100,000** Wheels in Stock.
WORCESTER, MASS.



ESTABLISHED 1837. CAPITAL \$100,000

Northampton Emery Wheel Co.
LEEDS, MASS.

And 20 South Canal St., Chicago,
MANUFACTURERS OF

EMERY WHEELS

AND
EMERY WHEEL MACHINERY

Of Best Quality.

Send for Catalogue. FACTORY AT LEEDS, MASS

DO NOT BE DECEIVED.

The Samson

is the best mounted grindstone on the market, and the weight is always as advertised.

Send for Catalogue C.

The Cleveland Stone Co.
CLEVELAND, O.

GEORGE E. BELL,

Successor to E. M. HYDE and UNION STONE CO.,

—SOLE AGENT—

Waltham Emery Wheels,
WALPOLE MILLS TURKISH EMERY.

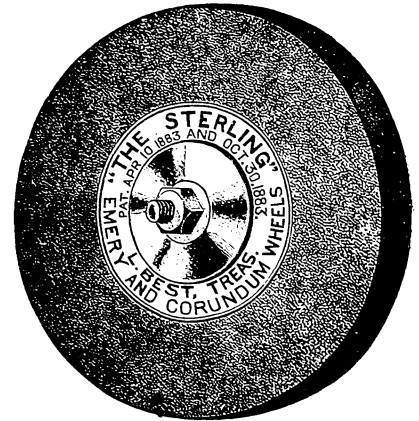
Dealer in Platers' and Polishers' Machinery and Supplies of all kinds. Foundry Supplies.

36 JOHN ST., NEW YORK

Sterling Emery Wheel Company, 174 Fulton St., N. Y.

FACTORIES:

Tiffin, Ohio, and West Sterling, Mass.



EXPERIMENTAL ELECTRICITY.

By EDWARD THEVERT.

Illustrated. - Cloth. - \$1.00.

CONTENTS—Some Easy Experiments in Electricity and Magnetism; How to Make Electric Batteries; A Galvanometer; An Induction Coil; An Electric Bell; A Magneto Machine; A Telegraph Instrument; An Electric Motor; A Dynamo; Electric Bell Fitting and Gas Lighting; Electric Lamps; Electric Terms.

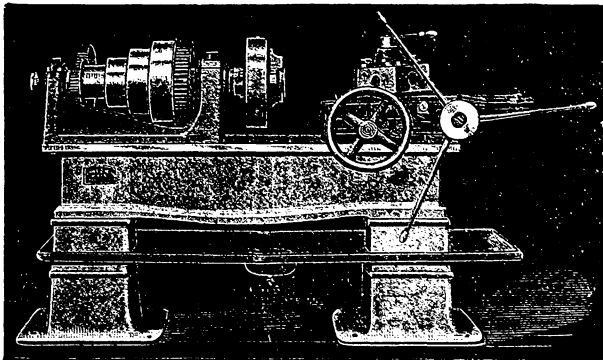
Sent, post-paid, on receipt of price by

DAVID WILLIAMS, Publisher & Bookseller,
96-102 Reade St., New York.

IT'S TO **Your Advantage**

to correspond with us regarding emery wheels.

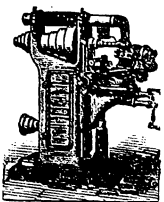
Grant Corundum Wheel Mfg. Co.
WORCESTER, MASS.



TURRET
MACHINES
LATHES,
MILLING
MACHINES,
SPECIAL
MACHINERY,

JOHN L. BOGERT, FLUSHING, N. Y.

Standard



is the milling machine made by us. Why? Because it is speedier in every respect and produces better work than any other. If you don't know much about "Milling Machines" write for pamphlet.

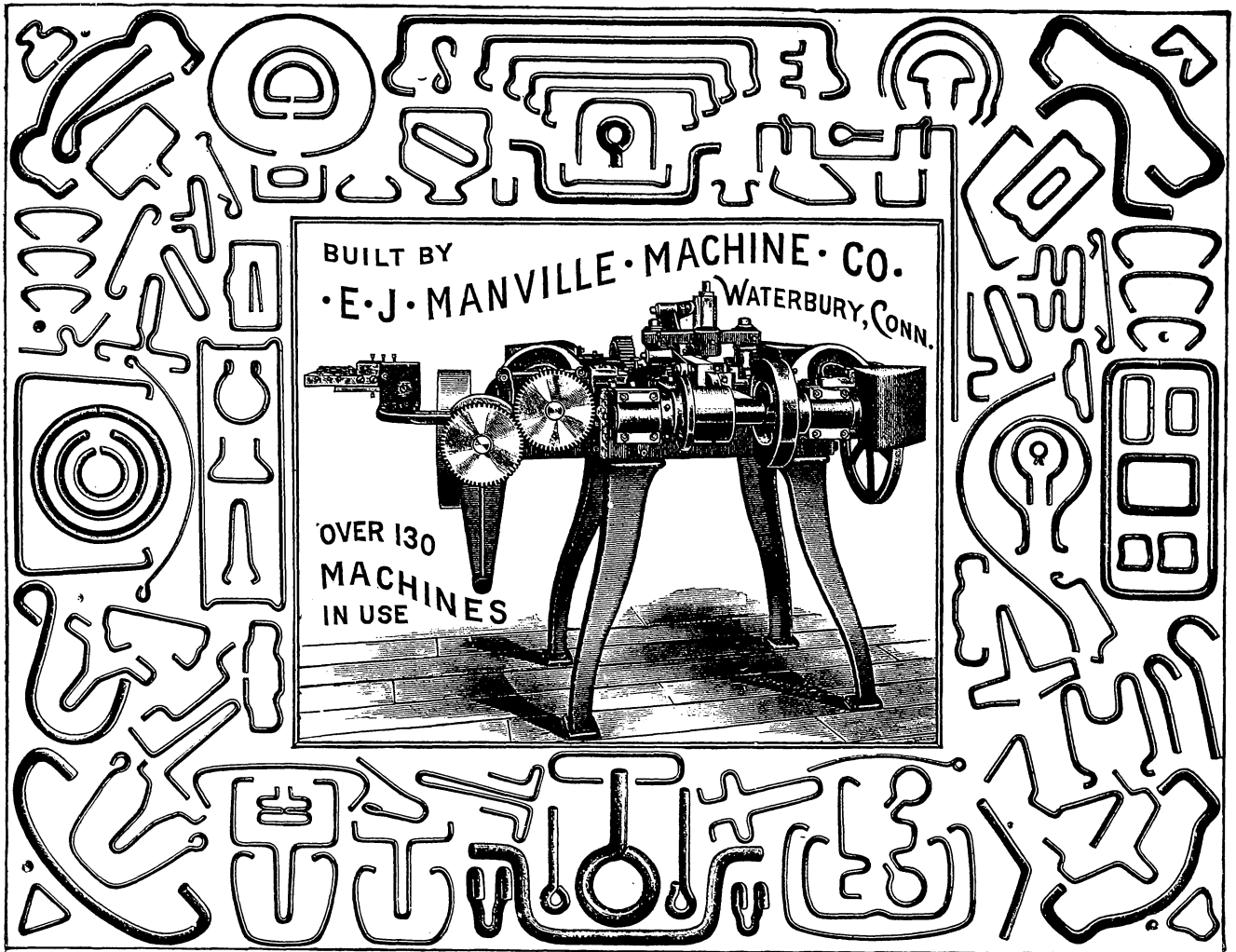
The Cincinnati Milling Machine Co.,
CINCINNATI, OHIO.

FOR NUMBERING AND LABELING
Boxes, Drawers and Shelves
In Hardware Stores and Factories.

Send for sample and description of our Handy Box of small gummed Letters and Figures, intended for labeling shelf boxes. Put up especially for the Hardware trade.

THE TABLET AND TICKET CO., Mfrs.,
87-89 Franklin St. Chicago. 99 Franklin St., New York.

**WILLSON'S
PAPER
LETTERS**



BUILT BY
• E. J. MANVILLE • MACHINE • CO.
WATERBURY, CONN.

OVER 130
MACHINES
IN USE

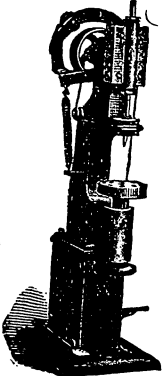
JOHN ADT & SON,

New Haven, Conn.,

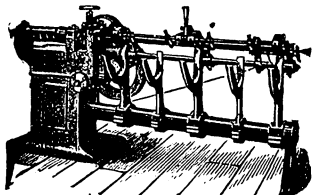
BUILDERS OF

MACHINERY FOR HARDWARE MANUFACTURE.

Elastic Rotary-Blow Riveting Machine.



Butt Milling Machinery.
Butt Drilling Machinery.
Riveting Machines.
Wire Straightening Machinery.
Foot Presses,
Sprue Cutters,
Etc.

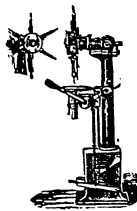


Automatic Wire Straightening and Cutting Machine

YOU CAN TIN CAST IRON

By the Flanders process, now in use by some of the largest firms in the country. Correspondence solicited for the erection of galvanizing or tinning plants. Address

THOS. SANDS, - - - - Nashua N. H.



QUINT'S TURRET DRILLS.

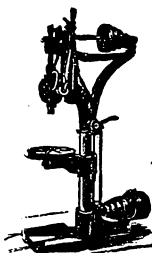
Six Spindle.

Drills from 1-32 to 1/4 hole. Speed from 250 to 2000 rev.

Suitable for a large variety of work and is operated with ease and rapidity.

SEND FOR CIRCULAR.

A. D. QUINT, Hartford, Conn.



FOR

Substantial, Well Made,
Low Priced, Patented

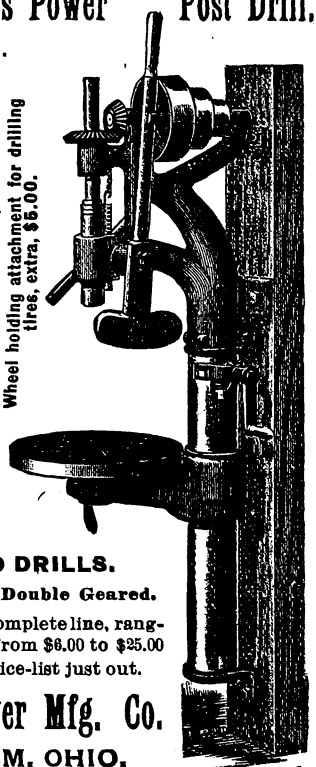
20 Inch Drills

with latest improvements,
Lever, Combination or Wheel
Feed, address

Sibley & Ware,
South Bend, Indiana.

Silver's Power Post Drill.

FIG. 727.



Has OUT GEARS, and is a thoroughly first-class tool in all respects. Dia. Column, 4 1/2 in.; Dia. Spindle, 1 3/8 in.; and bored No. 2 Morse Taper; Vertical Travel, 6 in.; Drills to centre 18 in. circle.

Weight, 325 lbs.; Price, \$60.00.

Wheel holding attachment for drilling three, extra, \$5.00.

HAND DRILLS.

Single and Double Geared.

Large and complete line, ranging in price from \$6.00 to \$25.00 list. New price-list just out.

The Silver Mfg. Co.
SALEM, OHIO.

BEFORE YOU ORDER AND SUBSCRIBE TO YOUR

FOREIGN PERIODICALS

FOR NEXT YEAR, PLEASE SEND FOR ESTIMATE TO

GUSTAV E. STECHERT, 810 Broadway, New York.

IMPORTER OF BOOKS AND PERIODICALS.

BRANCHES AT LEIPZIG, LONDON, PARIS.

Second-Hand MACHINERY

Bought, Sold and Exchanged.

Entire Machine and Boiler Shops
purchased.

Second-Hand Tools
taken in TRADE for
New Latest Improved Tools.

LARGE STOCK OF

SECOND-HAND TOOLS.

Lathes, Planers, Drills, Shapers, Milling
Machines, Screw Machines, Boring
Mills, Presses, Hammers, &c.

For Sale at Low Prices.

Agents for

PRENTICE BROS.,
HENDEY MCH. CO.,
POWELL PLANER CO.,
FITCHBURG MCH. WKS.

J. J. McCabe,
14 Dey Street, - New York.
Successor to E. P. BULLARD'S N. Y. Machinery
Warerooms.

For Sale Cheap.

Special lot of
NEW ENGINE LATHES,
ANY LENGTH OF BED.

Sizes 13, 15, 17, 20 and 22 in.

ADDRESS

Draper Machine Tool Co.,
Successors to
LATHE & MORSE TOOL CO.,
130 Gold Street. WORCESTER, MASS.

WANTED.

Responsible parties to manufacture and sell
on royalty, a cheap portable steel or iron **CUL-
VERT BRIDGE**; it is adapted to all small
streams, runs, etc., in roads, streets, **RAIL-
ROADS**, etc.; improved roads is the order of
the day; use this bridge, put it below the level
of the road, cover it over and thus prevent
jarring and wear and tear of vehicles, etc. Ap-
ply to
W. A. NICHOLS,
Girard Building, Philadelphia, Pa.

STEAM PUMPS FOR SALE.

We have on hand
One new Worthington Pump, $7\frac{1}{2}$ x $4\frac{1}{2}$ x 10.
Also two second-hand Pumps, in good order.
One Smith Vaile, 6 x 4 x 6.
One Knowles, 6 x $3\frac{3}{4}$ x 6.

HOOKE-COLVILLE STEAM PUMP CO.,
St. Louis, Mo.

Send for descriptive catalogue of Hooker
Pumping Machinery.

FOR SALE.

1 Engine Lathe, 24 in. swing x 25 ft. bed
Modern. First-class condition.
1 Lincoln Miller. Good order.
1 3 in. Cutting-off Machine. Nearly new.
1 No. 1, No. 2 and No. 6 Root's Blower.
Prices very reasonable.

COOKE & CO.,
163 and 165 Washington St., New York.

FOR SALE.

Wright Automatic Engine (Poppet Valve) 16
in. x 36.
F. McSWEGAN & SONS,
Dover St. and Franklin Square, New York.

BARGAINS.

Second-hand Machinery. Good Condition.
8 Friction Clutch Pulleys 60 in. x $10\frac{1}{4}$ in. x $\frac{1}{4}$ 7-16 in.
(Crescent).
1 Friction Clutch Pulley 80 in. x $12\frac{1}{4}$ in. x $\frac{1}{4}$ 7-16 in.
1 Friction Clutch Pulley 80 in. x 17 in. x $\frac{1}{4}$ 7-16 in.
1 Brown & Sharpe No. 1 Universal Miller.
1 2500-lb. Double Frame Steam Hammer. "dk. Miles.
1 2500-lb. Justice & Shaw Dead Stroke Hammer.
1 Planer 32 in. x 32 in. x 11 ft. Double head.
1 Planer 33 in. x 33 in. x $7\frac{1}{2}$ ft. Single Head.
1 "Hendey" Engine Lathe, 18 in. x 10 ft.
2 Bement Milling Machines.
1 Niles Screw Machine No. 2.
1 40 in. Harrington Drill Press, B. G. & P. F.
1 D. E. Whiten Gear Cutter.
1 Power Punch; capacity, $\frac{1}{4}$ -in. hole in $\frac{1}{4}$ -in. iron.
Throat 6 in. Parker, Snow & Co.
1 20 in. x 48 in. People's Works Horizontal Engine.
6, 8, 10, 15, 25 and 40 H.-P. Hoisting Engines.
1 60 in. x 15 ft. Hor. R. T. Boiler. Complete. 75 H.-P.
1 48 in. x 16 ft. Hor. R. T. Boiler. Complete. 50 H.-P.
150 ft. 30 in. Leather Belting.

L. F. SEYFERT'S SONS,
437-441 N. 3d St., Philadelphia, Pa.

METAL WORKING MACHINERY.

All kinds.

NEW AND SECOND HAND.

600 Machine Tools in
Stock.

Send for lists of Second-hand Machin-
ery and Secure Bargains.

PRENTISS TOOL & SUPPLY CO.,
115 Liberty Street, NEW YORK.
59 South Canal Street, CHICAGO, ILL.

PLANER, 24 in. x 20 in. x 5 ft., table. Good order \$150.00
PLANER, 30 in. x 30 in. x 6 ft., with chuck.
Good order 200.00
Lathe, 30 in. x 18 ft. Excellent order. 450.00
36 in. x 24 ft. Bk. G'd. Sc. Cut'g Gleason Lathe.
Good order. 475.00
No. 1 Dallett Portable Drill. Good as new. 90.00
26 in. Hvy. Drill Press. Back G'd. Good as new. 125.00
38 in. Bk. G'd. Drill, heavy. Good as new. 275.00
14-in. Heavy Lever Feed Drill. New. 50.00
21 $\frac{1}{2}$ -in. Heavy Lever Feed Drill. New. 150.00
Forging Drop, 100-lb. Hammer. New Design. 180.00
Wire Straightener and Cutter. Semi-Aut. 80.00
Bolt Cutter. New Head and Dies, $\frac{1}{2}$ to $1\frac{1}{2}$ in. 175.00
Power Punch Presses. \$75.00 and upward.
AMER. TOOL WORKS. Cleveland, O.

FOR SALE OR HIRE.

Engines with Cylinders 26 in. x 48 in. and
smaller.
Portable, Tubular and Vertical Boilers of all
sizes.
12-2 yard 8-ft. gauge all around Dump Cars.
7 Narrow Gauge and 2 Standard Gauge Loco-
motives.
1 Large Worthington Duplex and other Press-
ure Pumps. New and Second hand.
Hoisting Engines and Grinding Pans.
Rail, Sheet and Clipping Shears.

THOMAS CARLIN'S SONS,
Allegheny, Pa.

Boiler Makers' Machines FOR SALE.

BEMENT, MILES & CO. Make, NEW,
for Immediate Delivery
93-INCH Throat HYDRAULIC RIVET-
ING MACHINE, PUMP and ACCU-
MULATOR.
10-TON TRAVELING CRANE 24 ft
Bridge x 20 ft.
POWER SHEARING MACHINE No. 27,
30-inch throat.
PLATE PLANING MACHINE, Planes 16
ft. one setting, x 1 in. Plate.
POWER BENDING ROLLS, 8 ft. between
hoistings. Top Roll 11 inches, Bottom Rolls
11 inches, Dia., Ringed Hoistings.

Geo. Place Machine Co.
Warehouse, 511 & 513 West 13th St.
Office, 120 Broadway, New York.

FOR

MACHINERY

ADDRESS US.

Pennsylvania Mch. Co., Ltd.,
PHILADELPHIA, PA.

Machinery,

Second-Hand and New, on Hand.

No. 4, 3, 2 Stiles Punch Presses.
No. 1 $\frac{1}{2}$ and 0 Fowler Punch Presses.
No. 1 and 2 Screw Machines, Pratt & Whitney.
No. 1 Profiling Machine, " "
No. 3 Hand Miller, " "
15 x 5 Eng. Lathe, Taper Attch., " "
16 x 5 x 8 Eng. Lathe, Bridgeport Mch. Tool Wks.
200 lb. Drop Hammer, Bliss.
Magnetic Separating Machine, Dynamo for Electro-
plating, Shaping, Planing, Slotting
Machines, all Sizes.
Engine Lathes from 11 inch Swing to 90 inch Swing.
Drill Presses, Regular, from 10 to 44 inch Swing.
Radial, H. & Jones, 18 "
Gang Drills, 2 Spindle and 4 Spindle.
Lot of Special Drills for Butt Drilling.
Special Butt Milling Machine.
No. 12 Turret Lathe, $3\frac{1}{4}$ inch hole, Jones & Lamson.
No. 12 " " 24 inch Swing by 8 ft. Bed, Am.
T. & Mch. Co.
Lot of Polishing Mch., Leather Covered Wheels, etc.
Belting, Pulleys, Engines, etc., etc.

Boiler Shop Outfit of Machinery.

Send for our latest list or state what is
required.

Warehouse, 511 & 513 West 13th St.
Office, 120 Broadway, New York.

Geo. Place Machine Co.

32-INCH UPRIGHT DRILL PRESS.

TWO OF THEM; SECOND HAND.

Makers' Name, - KERKHOFF & CO.
Height, - - - - - 8 ft. 2 in.
Greatest Distance Spindle
to Base Plate, - - - 52 in.
Greatest Distance Table
to Spindle, - - - 38 in.
Weight complete, - - - 2600 lbs.
Back Geared and Power Feed, Quick Return,
Balanced Spindle; Shafts and Studs made of
Steel.

THE SCRANTON SUPPLY & MACHINERY CO.,
SCRANTON, PA.

For Sale, Very Low
for Cash.

500 tons Relaying Steel Street Rails,
side bearing, 35 to 47 lb. sections. Also
65-lb. Steel T's.

WM. H. PERRY & CO., Providence, R. I.

SEE HERE!

1 each Garvin No. 2 and No. 4 Milling Machines, 2d hand.
1 Pratt & Whitney Lincoln Miller No. 3, 2d hand.
1 Muller 16 x 6 Engine Lathe, 2d hand.
1 F. E. Reed 16 x 8 Engine Lathe, 2d hand.
1 Lodge & Davis 17 x 6 Engine Lathe, 2d hand.
1 Pratt & Whitney 19 x 6 Engine Lathe, 2d hand.
1 each Lodge & Davis, 21 x 8 and 21 x 10 do., 2d hand.
1 Dietz Gang 22 x 8 Engine Lathe, 2d hand.
1 New Haven 28 x 8 " "
1 Dietz Gang 80 in. Radial Drill, " "
1 20 in. Lever Drill, new.
1 each Lodge & Davis 15 in. and 20 in. Shaper, new.
1 Steptoe 28 in. Geared Shaper, new.
1 Gear Cutter, will cut up to 40 in., 2d hand.
1 Baker Bros. Universal Saw Bench, new.
A full line of the most improved Turret Lathes.

THE LODGE & SHIPLEY MACHINE TOOL CO.,
107-113 Culvert St., Cincinnati, Ohio.

FOR SALE.

2 Double Deck Boilers about 40 H.-P. each,
cheap. Hoisting Engine. Cylinder Boilers for
Stacks, 30, 36 and 42 in. diameter. Round and
Square Iron Tanks. Blow Offs. 5 Brass Can-
ons about 1400 or 1500 pounds each. Good
order. All kinds of Scrap Iron and Metals on
hand.

BUSSENIUS & CUNLIFFE,
12th and Washington Ave., Philadelphia.

WANTED TO BUY FOR CASH.

First-class modern Engine Lathes, Planers,
Drill Presses, Milling Machines, Bolt Cutters,
etc.

THE LODGE & DAVIS MACH. TOOL CO.,
Cincinnati, O., U. S. A.

Great Bargains.

Must be Sold and
Removed.

- 16 in. x 30 in. Horizontal Engine.
18 in. x 36 in. Horizontal Engine.
24 in. x 36 in. Horizontal Engine.
19½ in. x 48 in. Beam Engine, with
Knowles Condenser.

Write us for what you want.

LOVEGROVE & CO.,

Third and Quarry Sts., Philadelphia, Pa.

SECOND-HAND MACHINERY.

- One American Tool Co.'s No. 2 Cabinet
Turret Lathe, with slide rest; in fine order.
One Pratt & Whitney 36-in. Gap Chuck-
ing Lathe.
One Pratt & Whitney No. 3 Lincoln
Milling Machine.
One Iron Planer, 52 in. wide, 44 in. high,
12 ft. long, with two heads.
One Springfield Universal Grinding Ma-
chine No. 3, swing 18½ in. over the
ways and take 6 ft. between centers.
Has been used but a very few times and
is practically new.
One L. W. Pond Gear Cutter, to cut gears
36 in. diameter, 5 in. face, also ar-
ranged for cutting beveled gears.

HILL, CLARKE & CO.,

156 Oliver St., Boston, Mass.
12 and 14 South Canal St., Chicago, Ill.

SECOND-HAND MACHINE TOOLS.

ENGINE LATHES.

- 1 15 in. x 5 ft. Flather.
1 15 in. x 6 ft. Jones &
Lamson.
2 15 in. x 7 ft. S. C. Wright.
1 15 in. x 8 ft. Fitchburg.
1 16 in. x 7 ft. Bement.
1 16 in. x 6 ft. New Haven.
7 16 in. x 6 ft. F. E. Reed.
2 16 in. x 8 ft. F. E. Reed.
2 16 in. x 6 ft. Prentice
Bros.
1 16 in. x 6 ft. Perkins.
1 16 in. x 8 ft. Ames Mfg.
Co.
2 18 in. x 8 ft. Wm. Munzer.
1 20 in. x 6 ft. E. P. Bullard.
1 26 in. x 10 ft. New Haven.

PLANERS.

- 2 15 in. Lathe & Morse.
Crank.
1 20 in. x 20 in. x 6 ft.
Pratt & Whitney.
1 22 in. x 22 in. x 4 ft.
Pond.
1 24 in. x 24 in. x 5 ft.
Pond M. T. Co.
1 24 in. x 24 in. x 5 ft.
New Haven.
1 28 in. x 28 in. x 7 ft.
New Haven.
1 36 in. x 36 in. x 9 ft.
Enterprise Mch. Co.

DRILL PRESSES.

- 1 10 in. 3-Spindle Slate.
2 Garvin, Light Bench.
2 Garvin No. 2, 4-Spindle.
1 Pratt & Whitney, 3-Spin-
dle.
2 Pratt & Whitney, 4-Spin-
dle.
1 Garvin No. 4, 6-Spindle.

Also, large variety of other machines. Write for
complete list and detailed description.

THE GARVIN MACHINE CO.,

Laight & Canal Sts., New York

FLOOR PLATES.

FOR SALE.—A Superior Lot of Cast Iron
Plates 2 ft. x 4 ft. They are made to avoid warp-
ing and cracking. Will sell in lots to suit.

MATTHEW GILL, JR.,

308 Walnut St., Philadelphia Pa.

RAILS

FOR RELAYING.

- 10 tons 80 pound Steel T's.
65 tons 65 pound Steel T's.
50 tons 40 pound Iron T's.
650 tons 35 pound Iron T's.
250 tons 30 pound Iron T's.
10 tons 25 pound Steel T's.

STEAM ROCK DRILLS.

- 2 No. 4 Rands, with Tripods.
1 No. 3½ Ingersoll, with Tripod.
1 Bullock Diamond Drill for hand or power.
Nearly new.
Send for new list of good things.

THOS. P. CONARD,

206 Walnut Place, Philadelphia.

WE ARE OFFERING BARGAINS IN THE FOLLOWING PIECES OF SECOND- HAND MACHINERY.

- 14 x 18 High Speed Engine, 2 watts 60 in. dia.,
14 in. face.
18 x 48 Corliss Engine, wheel 16 ft. dia., 25 in.
face.
16 x 48 Corliss Engine, wheel 16 ft. dia., 9 tons.
2 Horizontal Tubular Boilers, 5 ft. dia. x 17 ft.
long.
7 Horizontal Tubular Boilers, 5 ft. dia. x 15 ft.
long.
Smith Valve Compound Duplex Pump, 14-20 x 15
x 15.
Worthington Compound Duplex Pump, 10-16 x
10½ x 10.
Davidson Pump, 24 x 12 x 24.
500 H.-P. J. P. Witherow, Pittsburgh, Pa.,
Heater.
Edison Dynamos of 75, 150, and 300 lights, with
lamps, sockets, switches, wire, &c.

MARVIN BRIGGS, 12 Broadway, N. Y.

MACHINERY, TOOLS, &c.

- Engines, all sizes, Slide Valve and Automatic.
Boilers, all sizes, Horizontal, Vertical and Locomotive.
Hoisting Engines, Portable Engines, Steam Pumps.
20 Screw Cutting Lathes, 12 in. to 24 in. swing.
20 Bement Milling Machines.
24 in., 30 in. and 36 in. Planers, 6 in., 12 in. and 15 in.
Shapers.
44 in. Radial Drill, 1½ in. National Bolt Cutter.
Power Shears, ¾ in. Iron, 15 in. Gap.
Hydraulic and Punching Presses.
10 lbs., 25 lbs., 60 lbs. hammers for belt.
4½ Pratt and Whitney cut-off machine.
Brown & Sharpe Grinding Lathe.
FRANK TOOMEY, 131 N. Third St., Philadelphia, Pa.

- 4 3 H.-P. Vertical High Pressure Engines.
2 5 H.-P.
3 6 x 10 Horizontal Engines.
2 8 x 12 "
2 10 x 14 "
8 5 H.-P. Gas Engines.
5 10 H.-P.
1 8 x 12 D. C. Hoisting Engine.
3 Rock Crushers.

H. H. MANSFIELD,

126 Liberty St., New York

Heavy Plate and Bar Shears, Engines,
Boilers, Pumps, Cranes, Fairbanks Testing
Machine, &c., &c., for sale by
MATTHEW GILL, Jr.,
Philadelphia, Pa.

WANTED.

To buy for cash, a Gates No. 4 or 5 second-
hand Rock Crusher. Must be in good condition.
"ROCKBREAKER."
P. O. Box No. 182, Baltimore, Md.

Second-Hand Rails FOR SALE.

In lots to suit, and ready for delivery.

- 3000 tons 60 lb. Steel T Rails.
450 tons 55 lb. Steel T Rails.
800 tons 54 lb. Steel T Rails.
400 tons 50 lb. Steel T Rails.
950 tons 40 lb. Steel T Rails.
50 tons 35 lb. Steel T Rails.
500 tons 35 lb. Iron T Rails.
250 tons 30 lb. Iron T Rails.
120 tons 30 lb. Steel T Rails.
150 tons 25 lb. Iron T Rails.
140 tons 20 lb. Steel T Rails.
60 tons 16 lb. Steel T Rails.
1700 tons Johnson Girder Rails, 38, 48, 52 and 66 lb.
Rails.

All selected and in excellent condition for relaying
and only slightly worn.
Second hand selected and sound rails furnished in
specified lengths for builders' use. For prices and
particulars apply to

JOSEPH JEWKES,

Railway Equipment, Pittsburgh, Pa.

WANTED.

Practical Boiler Maker with small capital and
business, to take interest in small shop. Fair
business established and a good opportunity to
an energetic man of ability. Applicants must
be well recommended as to mechanical ability
and moral character, and other things equal
American preferred. Address

"W. B. & S."

office of *The Iron Age*, 96-102 Reade St., New
York.

CORLISS

and other Automatic, Slide Valve Engines,
Boilers, Steam Pumps, &c., &c.

CORLISS.	HIGH SPEED AUTOMATIC.	HORIZON- TAL SLIDE VALVE.	VERTICAL SLIDE VALVE.
10 x 20	9½ x 12	8 x 10	28 x 30
10 x 24	10 x 12	9 x 18	20 x 24
11 x 36	11 x 20	9 x 24	18 x 16
14 x 30	12 x 18	10 x 12	18 x 12
14 x 36	10 x 14	10 x 14	10 x 12
16 x 42	12½ x 15	10 x 24	10 x 10
18 x 36	15½ x 16	10 x 16	9 x 10
20 x 42	13 x 12	11 x 20	9 x 9
22 x 48	SLIDE	12 x 18	8 x 10
23 x 36	VALVE HOR.	12 x 24	7 x 9
26 x 48	24 x 48	14 x 24	7 x 7
28 x 60	22 x 30	15 x 24	6 x 6
30 x 60	20 x 48	16 x 36	5 x 5
30 x 72	20 x 36	15 x 30	

HORIZONTAL BOILERS, 3, 6 x 16; 8, 5½ x 16;
6, 5 x 16; 3, 5 x 18; 1, 4½ x 12 and several
others.

LOCOMOTIVE BOILERS, 15, 30, 45, 50, 60, 80,
100 and 150 H.-P.

ONE 1000 gal. Duplex Fire Pump, Brennan
Crusher, Bogardus Mill, Burr Mill, Fan
Blowers, Platform Scales, etc., etc. Send
for catalogue.

G. M. CLAPP,

74 Cortlandt St., New York.

PLATE MILLS

For sale, one 2 high and one 3 high 30-inch Train, will
roll heavy and light plates up to 50 in. In complete
order. Made by Garrison & Co.
MATTHEW GILL, Jr., Philadelphia, Pa.

GUILLOTINE SHEAR.

For sale, Morgan, Williams & Co. Guillotine Shear, En-
gine attached, Knife 104 inches long, will cut heavy
steel plates. (Has Auxiliary shear on back.)
MATTHEW GILL, Jr., Philadelphia, Pa.

HEAVY ENGINE.

For sale, Horizontal Engine 39 in. x 72 in.; 2
Fly Wheels weighing 53 tons each.
MATTHEW GILL, Jr., Philadelphia, Pa.

ROLL LATHE.

For sale, one heavy Roll Lathe made by Gar-
rison & Co., will take in 12 ft. Roll and turn to
40 inches. **MATTHEW GILL, Jr.,** Phila., Pa.

!!! FOR SALE !!!

BAKER BLOWERS, Nos. 1, 4½, 5, 6 and 7.
ROOT BLOWERS, Nos. 1, 2, 3, 4, 5, 6 and 7.
Sturtevant Blowers, Nos. 4, 5, 6, &c.
1 Corliss Band Wheel, 12 ft. x 24 in. in halves
A Variety of Machinery, such as Boilers, En-
gines, Pumps, Crushers, &c., very cheap.
Do you want to buy or sell Machinery? If so, write
C. R. BIGELOW, Machinery Expert,
45 Dey St., New York City.

FOR SALE CHEAP.

2 Hazleton Porcupine Boilers,
250 H.-P. each. 1 Harrison Safety
Boiler, 75 H.-P. 1 Calloway Boiler,
60 in. diameter, 60 H.-P. 2 Horizontal
Tubular Boilers, 48 in. x 9 ft., 35
H.-P. Also 15 Cylinder Boilers, 36
in. diameter, different lengths.
G. W. SCHULTZ & CO.,
308 Walnut St., PHILADELPHIA, PA.

FOR QUICK SALE.

One Otis Steam Shovel in good condition.
Two 12 ton 3-ft. Gauge Locomotives.
Two Standard Gauge Saddle Tank Locomotives.
20 Dump Cars, 3-ft. Gauge, 3-yd. Capacity, Side
Dump.
3000 tons Mill Cinder, &c.
Also Big Iron, Muck Bars, Bar Iron and Steel
Billets, Scrap, &c. We are always in the
market to buy and sell Equipment and Scrap.
G. H. SIBELL & CO.,
62 and 64 Michigan Ave., Chicago, Ill.

Trustee's Sale of Machine Shop Equipment.

Lathes, 52 in. swing by 41 ft., 54 in. swing by 22 ft.,
30 in. swing by 22 ft. One Flat Bed Lathe.
Planers, 54 in. wide by 20 ft., 36 in. wide by 13 ft.
Drills, 36 in. upright, 5 ft. post, 20 in. post.
Engines, 5 new and 7 second-hand, from 100 H.-P.
down.
Circular on application.

W. A. BOLE, Trustee,

Liberty Ave., cor. 25th St.

Pittsburgh, Pa.

SOME BARGAINS HERE.

- 1 Hendey Shaper, 15 in. stroke, imp. vis.
1 14 x 6 Screw Cutting Engine Lathe, New.
1 6 in. hole in Turret Screw Machine and Counter, \$25.
2½ Hendey Cutting-off Machine. New.
1 3-Spindle Garvin Drill Press, used 1 month.
100 H.-P. Woodbury Engine. 2d-hand Good order.
2 50 H.-P. Woodbury Boilers. Good order.
2 75 H.-P. Woodbury Boilers. Good order.
75 H.-P. Ball Engine. 2d-hand. Good condition.
Also variety of Engines, Boiler Pumps, &c.
And other machinery, new and second hand. Write
for prices. **Machinists' Supply Company,**
39, 41 and 43 Central Ave., Rochester, N. Y.

PITTSBURGH SALES AGENCY,

J. H. HILLMAN, Manager,

No. 8 Wood St.,
Pittsburgh, Pa.,

IS NOW ENGAGED IN THE

Sale AND Reorganization

—OF—

Manufacturing Plants,

INCLUDING

Blast Furnaces, Rolling Mills, Machine Shops, Foundries, Agricultural Works, and Manufacturing Establishments Generally.

Examinations and Reports
on Properties.
References on Application.

SECOND-HAND MACHINERY.

- 4 11 in. x 5 ft. Engine Lathes, Reed and Prentice.
- 2 12 in. x 5 ft. Young Speed Lathes.
- 2 15 in. x 8 ft. Reed Engine Lathes, R. & F. & P. R.
- 6 16 in. x 6 ft. Engine Lathes, Young, Reed, Blaisdell and Fletcher.
- 2 18 in. x 8 ft. Engine Lathes, New Haven and Dustin.
- 4 20 in. x 6 ft. and 8 ft. Engine Lathes, Bullard.
- 1 20 in. x 8 ft. Pattern Lathe and Floor Stand.
- 1 20 in. x 6 ft. Bullard Turret Lathe (c), Power Feed.
- 4 Brainard No. 7 Millers, 2 with arm.
- 1 Brainard Heavy No. 6 Lincoln Pattern Miller.
- 1 Brainard No. 15 Universal Miller.
- 2 Brainard No. 5 Universal Millers.
- 1 B. & S. No. 1 Universal, complete.
- 3 Garvin Millers, Nos. 2, 3, and 4.
- 1 Blaisdell 30 in. Single Spindle Drill.
- 1 Garvin 1 1/2 spindle Profiling Machine.
- 3 Sensitive Drills, Slate, 1, 2 and 3 spindle.
- 1 20 in. 38 in. Wood & Laight Gap Drill.
- 2 F. & W. Drills, 1 and 2 spindle.
- 2 Bench Drills, capacity 5-16 in.
- 2 Suspension Drills, Pond, heavy.
- 2 Punch Presses, 1 Wilder and 1 Stiles.
- 2 Garvin No. 2 Wire Feed and Plain Screw Machines.
- 1 Garvin Small Gear Cutter.
- 1 Bullard 16 in. Stroke Shaper.
- 1 6 in. B. & P. Shaper, Hand and Power.
- 2 Bolt Cutters, 1 1/2 capacity.
- 6 Speed Lathes, Garvin and Young.
- 1 No. 4 Diamond Grinder.
- 1 Forge.
- 1 27 x 27 x 6 ft. English Screw Planer.
- 1 8 ft. Vertical Boring Mill, 2 heads and pulley attach.
- 1 30 x 30 x 8 ft. Niles Planer.
- 1 Bement Axle Lathe, Single.
- 1 36 in. x 18 Engine Lathe.

ALSO LARGE STOCK NEW TOOLS

THE NILES TOOL WORKS CO.,

Eastern Branch, 136, 138 Liberty St., N. Y. City.

New York Agents PRATT & WHITNEY CO.

MACHINE SHOPS.

For sale, to settle an estate, the machine shops of the late firm of Carter & Allen, adjoining and connecting with the Philadelphia & Reading Railroad at Tamamora, Pa. The improvements include Boiler Shop, Foundry, Machine Shop, Erecting Shop, Pattern House, Boiler House, Blacksmith Shop, etc., etc. Also Machinery, including Engine, Shafting Drills, Lathes, Forges, etc., etc. Also large stock of patterns for various work, including furnace and mine machinery, hoisting and stationary engines, etc., etc. Buildings are well adapted for their purposes. May be examined on application to WALLACE GUSS, Cashier First National Bank of Tamamora, Pa., or to the ESTATE OF WILLIAM T. CARTER, Deceased.

THE FIDELITY INSURANCE, TRUST & SAFE DEPOSIT CO.,
327 Chestnut St., Philadelphia,
WAYNE MACVEAGH,
Bullitt Building, Philadelphia,
Executors.

FOR SALE, CHEAP.

400 tons of 60 lb. rails, 200 tons of 52 lb. steel rails, 400 tons of 35 lb. second-hand iron rails with fastenings, one 4 horse-power engine and 8 horse-power boiler. Also other engines and locomotives, second-hand. Sawed and out rails a specialty.

J. H. RICHARDSON & CO.,
Pittsburgh, Pa.

FOR SALE.

Corliss Engine and Boilers for sale, nearly new, 250 H.-P., also a large assortment of Bundy Radiators, Quarry Pumps, Boilers, Engines and miscellaneous Machinery.

WILSON & ROAKE,
Front and Dover Sts., New York City

FOR SALE.

LOT OF
SECOND-HAND NARROW GAUGE
PLATFORM CARS.

Overhauled and in No. 1 condition.
RUSSEL WHEEL & FOUNDRY CO.,
Detroit, Michigan.

WANTED.

A Hand-Power Traveling Crane, Second-hand, of about 5 tons capacity or larger. State lowest price and give description. Address "CRANE," No. 1221, office of *The Iron Age*, 96-102 Reade St., New York.

TO HARDWARE MANUFACTURERS.

An old established firm, having intimate acquaintance with all the large buyers of the West, Northwest, South and East, with the exception of New England States, wishes to represent manufacturers of hardware. Have had many years' experience, and can furnish first-class references. Address

"X. Y. Z.,"

office of *The Iron Age*, 59 Dearborn St., Chicago.

FOR SALE.

Manhattan Rolling Mill, 445 West St., New York, established 30 years, where the celebrated brand of J. L. Horse Shoe Iron is made. There is also a large trade in Blacksmiths' Supplies and Scrap Iron. Reason for selling, death and sickness.

JOHN LEONARD.

WANTED.—A large second-hand Lathe, to swing about 8 feet, with short bed; something like a Locomotive Driving Wheel Lathe would answer, with compound screw, screw feed, and in A. No. 1 condition. Address "SECOND-HAND LATHE," office of *The Iron Age*, 96-102 Reade St., New York.

FOR SALE. HARDWARE STOCK.

Good stock of Hardware, invoice \$4000, good store building with living rooms above, valued at \$2500, in a good town in Southwestern Minnesota; only hardware store in the town; good established trade of \$15,000 a year. This is a rare chance to go into business. Address

F. A. & A. J. MEACHAM,
Edgerton, Minn.

FOR SALE.

Stock of Hardware, Stoves, Paints and Glass, no agricultural implements, invoicing about \$30,000; no indebtedness or book accounts. One of the most solid towns in the middle West. Present owner has been in same business in same town for 40 years and wishes to retire. Stock can be reduced considerably if desired. This is the cleanest stock in Minnesota. Address T. H. LOYHED, Faribault, Minn.

DON'T INVEST in expensive tools or machinery or let a contract before getting our estimate for making novelties or parts. Fine, difficult and accurate parts a specialty. White metal work at prices that cannot be duplicated. Inventions perfected. Models made. Secrecy and satisfaction guaranteed, and no extra charge for new ideas or improvements. To insure reply to letters of inquiry only, enclose stamp. THE H. H. FRANKLIN MFG. CO.,
Syracuse, N. Y.

RARE CHANCE

for a capable energetic party with \$10,000 to \$15,000 to assist in managing a well established business. A good position assured. Address

"RARE CHANCE," 127,

office of *The Iron Age*, 96-102 Reade Street, N. Y.

FOR SALE.

Two 80-lb. Lever Trip Hammers, about new, first-class condition, made by Williams, White & Co. Moline, Ill., weight about 7500 lbs. each. One 100-lb. Jenkins Upright Cushioned Helve Hammer, practically new, made by Jenkins & Lingle, Bellefonte, Pa.

One set of small Rolls for Rolling Carriage Springs and other light work.

All of the above at reasonable prices, or will exchange for medium sized Steam Hammers or large Power Presses.

DANIEL L. HEISKELL, Wheeling, W. Va.

D e

CHARLES WEILAND.

I make a special business of buying and selling Job Lots of

HARDWARE AND CUTLERY.

Tools and Second Quality Files a Specialty.
Send for Catalogue,

149 Chambers St., New York.

Collections!

ATTENTION! Merchants and Manufacturers.—We collect your past due accounts. Do not let them remain too long upon your books. Our terms just and fair.

THE HARDWARE BOARD OF TRADE, Ltd.,
and 8 Warren street, New York.
JAS. H. GOLDEY, Treas.

EUGENE BISSELL, Auctioneer.
E. BISSELL, SON & CO.,
Successors to
HAYDOCK & BISSELL,
WHOLESALE

HARDWARE AUCTIONEERS,
12 Murray St. and 15 Park Place, N. Y.
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

FOR SALE. CRANK and GEARED SHAPERS.

Write us for Bargains.

J. STEPTOE & CO., Cincinnati, O.

!! ESTIMATE WANTED !!

For supplying several thousand tons of Painted Cast Iron Floor Plates, 3/8 in. thick, 1 in. ribs one side, also 5 in. wide Gutters and Traps. All free from warp and of good iron. Address

"ESTIMATES,"

office of *The Iron Age*, 96-102 Reade St., New York.

KEEP BOOKS

by WEST'S New Original-ENTRY LEDGER.

Make the same entry but once. A Ledger in place of a full set of books. Convenient forms for all entries. Easily applied, simple, saves time. West's Self-Proving Balance locates every error. Send 3 cent Stamps for illustrated 16-page pamphlet.

WOLCOTT & WEST, Syracuse, N. Y.

LUXURY ON WHEELS.

The "Electric" trains of the Cincinnati, Hamilton & Dayton R. R. and "Monon" Route between Cincinnati and Chicago are provided with the latest product of the Pullman Co. built expressly for this service. There are 10 compartments in each car, which may be converted at will into complete drawing rooms, most beautifully and harmoniously decorated, lighted by the Pintsch gas system, and are positively the most modern equipped sleeping cars in the world. This is the only line running Pullman Vestibule and Dining Cars between the cities named. THE World's Fair Route. See that your ticket reads C., H. & D. and Monon Route.

D. G. EDWARDS, G. P. & T. Agent,
Cincinnati, O.

Wanted, Contracts

For building mining, blast furnace, rolling mill and factory machinery, for making castings for cable and electric railroads, or any special line of castings. Address

MAHONING FOUNDRY AND MACHINE SHOP

Danville, Pennsylvania.

WANTED.

To furnish reasonable estimates on specialties in light metal work.

CLARK & COWLES, Plainville, Conn.
Manufacturers of Clock Trimmings, Rivets, Springs &c.

BUNDLING WIRE FOR SALE.

We have about 100 tons of Telegraph Wire, in rolls for bundling, from 7 to 14 gauge. It is in excellent condition and will sell all or part at \$13.00 per net ton, F. O. B. cars Chicago, cash. Correspondence solicited.

SWARTS IRON & METAL CO.,
(Chicago's Leading Iron house,
551 to 557 So. State St., Chicago, Ill.

FOR SALE, CHEAP.

About 400 lbs. of No. 26 B. & S. gauge fine finish Sheet Aluminum.

FERRACUTE MACHINE CO.,
Bridgeton, N. J.

CONTRACTS WANTED.

To build light or heavy special Machinery, Patented articles, tools, etc. Facilities for experimental work. Correspondence solicited.
The L. E. RHODES CO.,
Hartford, Conn.

WANTED.—A second-hand Steam Engine with steam cylinder 10 x 30 or 12 x 30 or 14 x 24, either Corliss valve gear or modern style slide valve. Engine must be in good condition. Address "STEAM ENGINE," office of *The Iron Age*, 96-102 Reade Street, New York.

WANTED, BUSINESS.

An experienced office man with \$25,000 or more will enter an established manufacturing or jobbing business, which will stand satisfactory investigation. Address with particulars, in confidence,
"N. R. G.," No. 1228,
office of *The Iron Age*, 96-102 Reade St., N. Y.

WANTED.

A Corliss Engine, about 16 x 48. Address
ROOM 39,
Standard Block, Cleveland, O.

Chattel Mortgage Sale OF MACHINERY FOR MAKING

STEEL SPRINGS, BICYCLE SPOKES, BICYCLE CHAIN,

Comprising a complete plant for the manufacture of these goods and consisting of 4 Lathes, Garvin Spring Winder, Tempering Oven, Japanning Oven, Japanning Tank, Tables, Vises, Blowers, Grinding Machine, Arbors, Bending Tools, Hammers, Forge, Tumbling Barrel, Blake & Johnson Spoke Header, Blake & Johnson Thread Roller, Milling Machine, Press, Riveting Machine, Screw Machine, Hand Truck, Scale, Desk, Safe, &c., &c. For the most part new machinery, in use about eight months. 17,000 lbs. Wire, tempered and untempered.

TO BE SOLD AT PUBLIC AUCTION,

—ON—

Tuesday, January 9th, 1894,

At 11 a. m., at 315 East 22d St., New York.

Catalogues may be obtained by addressing

W. G. & A. L. BROWN,
170 BROADWAY, NEW YORK.

AN OLD ESTABLISHED hardware house in New York, whose salesmen cover the entire United States, wants the sole agency of American manufacturers of Chains, Toilet Clippers, Locks, Files, Carpenters' Tools and similar articles. Address

"W. B. G.," No. 105,

office of *The Iron Age*, 96-102 Reade St., New York.

THE LATEST BOOKS.

Notes on the Testing and Use of Hydraulic Cements. By FRED. P. SPAULDING. NATURE AND PROPERTIES OF CEMENT: Definition; Portland Cement; Natural Cement; Slag Cement; Setting; Hardening; Adhesion; Soundness; Permanence of Volume. CEMENT TESTING: Object of Testing; Weight and Specific Gravity; Fineness; Rate of Setting; Tensile Strength; Ordinary Tests for Soundness; Accelerated Test for Soundness Chemical Analysis; Compressive Tests; Adhesive Tests; Microscopic Examinations: Abrasive Tests Air Slaking. THE USE OF CEMENT: Sand for Mortar; Water for Mortar; Mixing Mortar; Preparation of Concrete; Mixtures of Lime and Cement; Freezing of Mortar; Permeability of Mortar; Expansion and Contraction of Mortar; Retempering Mortar; Literature Relating to Cement. Cloth.....\$1.00

Pocketbook of Pocketbooks. Molesworth's Pocketbook of Engineering Formula and Hurst's Architects and Surveyors' Handbook. Bound together in one volume, 32mo, Russia leather. \$5.00

Drum Armatures and Commutators. By F. M. WEYMOUTH. Theory and practice. A complete treatise on the theory and construction of drum winding, and of commutators for closed-circuit armatures, together with a full résumé of some of the principal points involved in their design; and an exposition of armature reactions and sparking. 224 pages, illustrated, 8vo, cloth.....\$3.00

A B C Five-figure Logarithms for General Use. By C. J. WOODWARD. Containing mantissa of numbers to 10,000. Log. lines, tangents, cotangents and cosines to 10 seconds of arc. Together with full explanations and simple exercises showing use of the tables. Flexible leather cover and size convenient for the pocket.....\$1.60

An Elementary Treatise on Theoretical Mechanics. Part I.—Kinematics. By ALEX. ZIVERT. With diagram. 8vo.....\$2.25

Sewage Purification in America. By M. N. BAKER. A description of the municipal sewage purification plants in the United States and Canada. 186 pages, illustrated, 16mo, cloth.....\$1.00

A Select Bibliography of Chemistry, 1492 to 1892. By H. C. BOLTON. Paper.....\$3.50

A Practical Treatise on the Strength of Materials, including their elasticity and resistance to impact. By THOS. BOY. Third edition. 525 pages, 27 plates, 8vo, cloth.....\$7.25

Iron and Steel. The Journal of the Iron and Steel Institute. No. 1, 1893. 476 pages, with plates, 8vo, cloth.....\$6.00

Sound Sense in Suburban Architecture. By F. T. LEWIS. Containing hints, suggestions and bits of practical information for the building of inexpensive country houses. 92 pages, illustrated, 8vo, cloth.....\$1.00

Practical Building Construction; a handbook for students. By J. P. ALLEN. 450 pages, with about 1000 illustrations, 8vo, cloth.....\$5.00

Elements of Handycraft and Design. By W. A. S. BENSON. 166 pages, illustrated, 12mo, cloth.....\$2.00

Elementary Lessons, with Numerical Examples, in Practical Mechanics and Machine Design. By R. G. BLAINE. New edition, revised and enlarged. With 79 illustrations, 12mo, cloth.....\$2.00

Coal Mining. The Coal and Metal Miners' Pocket-book of Principles, Rules, Formulas and Tables. Specially compiled and prepared for the convenient use of mine officials, mining engineers and students preparing themselves for certificates of competency as mine inspectors or mine foremen. Illustrated, 12mo, cloth.....\$2.00

A Practical Guide for Prospectors, Explorers and Miners; a manual for all those engaged or interested in the search for or development of metallic and other mineral deposits. By C. W. MOORE. 294 pages, illustrated, 8vo, cloth.....\$5.00

An Elementary Text-Book of Coal-Mining. By R. PEEL. 280 pages, 12mo, cloth.....\$1.00

Electric Light Installations. By SIR D. SALOMONS. In 3 vols. Vol. I. The Management of Accumulators; a practical handbook. Seventh edition, revised and enlarged, 164 pages, 12mo, cloth.....\$1.50

The Colliery Manager's Handbook. By CALEB FAMELY. A comprehensive treatise on the laying out and working of collieries. A book of reference for colliery managers and for the use of coal mining students preparing for first-class certificates. 600 pages and 500 illustrations. Second edition revised with additions. 8vo, cloth.....\$8.50

Cements, Pastes, Glues and Gums. By H. C. STANDAGE. A practical guide to the manufacture and application of the various agglutinants required in the building, metal working, wood working and leather working trades, &c. With upward of 900 recipes and formulas. 12mo, cloth.....\$1.00

A History of the Theory of Elasticity and of the Strength of Materials, from Galilei to the Present Time. By ISAAC TODHUNTER, D.Sc., F.R.S.A. Edited and completed for the Syndics of the University Press by KARL PEARSON, M.A. Vol. II. Saint-Venant to Lord Kelvin. Paris I and II. 8vo, cloth.....\$7.50

Civil Engineering, Public Works and Architecture. By PROF. WM. WALSON. Extract from reports on *Paris Universal Exposition*, 1889. Illustrations and plates. 8vo, cloth.....\$5.00

Experimental Electricity. By E. T. TREVERT. Numerous illustrations. New revised and enlarged edition. 12mo, cloth.....\$1.00

Steamships and Their Machinery. From first to last. By J. W. C. HALDANE. 8vo cloth.....\$6.00

The Progress of Marine Engineering, from the Time of Watt to the Present Day. By THOS. MAIN. 67 illustrations. 12mo, cloth.....\$3.00

Heat. By MARK R. WRIGHT. With 136 illustrations. 346 pages. 12mo, cloth.....\$1.50
The present work is intended for those who have read the elementary parts of the subject, as treated in the author's "Sound, Light and Heat," or who are able to understand a more advanced work.

The Miners' Handbook. By JOHN MILNE. A handy book of reference on the subject of mineral deposits, and other interesting mining matters. 10mo, cloth.....\$3.00

Arts and Crafts. By WM. MORRIS. Essays by the Members of the Arts and Crafts Exhibition. 12mo, cloth.....\$2.50

British Locomotives: Their History, Construction, and Modern Development. By C. J. BOWEN COOKE. With numerous illustrations from sketches and diagrams and reproductions of official drawings and photographs. 12mo, cloth.....\$2.00

Continuous Current Dynamos and Motors. By FRANK P. COXE. An elementary treatise for students and engineers. Illustrated. 12mo, cloth.....\$2.00

Varnishes, Lacquers, Printing Inks and Sealing Waxes; Their Raw Materials and Their Manufacture. By W. T. BRANT, to which is added the art of varnishing and lacquering, including the preparation of putties and of stains for wood, ivory, bone, horn and leather. 336 pages with 39 engravings. 12mo, cloth.....\$3.00

Principles of Fitting. For apprentices and Students in Technical Schools. By a Foreman Pattern Maker. 313 pages, 12mo, cloth.....\$1.50

The Ore Deposits of the United States. By JAS. F. KEMP. A condensed account of the metalliferous resources of the country. As a text book and work of reference. 8vo, cloth. Illustrated. \$4.00

Tables for the Determination of the Rock-forming Minerals. Compiled by F. LEOWINSON-LESSING. Translated from the Russian by J. W. GREGORY, B.Sc., F.G.S. With a chapter on the Petrological Microscope by Prof. GREENVILLE A. J. COLE, M.R.I.A., F.G.S. 8vo, cloth.....\$1.25

Handbook of Ornament. By FRANZ SALES MEYER. A grammar of art industrial and architectural designing in all its branches, for practical as well as theoretical use. Authorized English edition. 680 pages, illustrated, cloth.....\$3.60

The Electric Transmission of Intelligence. By PROF. E. J. HOUSTON. And other Advanced Primers of Electricity. 88 illustrations. 12mo, cloth.....\$1.00

Plumbing, Drainage, Water Supply and Hot Water Fitting. By JOHN SMEATON. 222 illustrations. 8vo, cloth.....\$3.00
Contents: Introduction; drainage; danger from city wells; external plumbing; internal plumbing and fittings; sanitary plumbing; water service, and tapping of mains under pressure; water supply; ornamental leadwork; heating; hot-water work; index.

Handbook on the Steam Engine. Translated by H. H. P. POWLES. 12mo, cloth.....\$3.50

Edwards' 900 Examination Questions and Answers for Engineers and Firemen, Stationary and Marine, who Desire to Obtain a U. S. Government or State License. By EMORY EDWARDS, Marine and Mechanical Engineer, Associate Editor "The American Shipbuilder." A new revised and enlarged edition. In one volume. 240 pages. Full bound in pocket-book form, leather, gilt edges. \$1.50

Pocket Book of Useful Formulae and Memoranda for Civil and Mechanical Engineers. By G. L. MOLESWORTH. Twenty-third edition, revised and enlarged. 782 pages, 32mo, roan, gilt edges.....\$2.00

Hydraulic Power and Hydraulic Machinery. By H. ROBINSON. Second edition revised and enlarged. 69 plates and numerous illustrations. 8vo, cloth.....\$13.50

Twenty Years' Practical Experience of Natural Asphalt and Mineral Bitumen. By W. H. DELANO. Illustrated. 12mo, parchment.....50c

Universal Bimetallism and an International Monetary Clearing House. With a record of the world's money, statistics of gold and silver, etc., By R. P. ROTHWELL. cloth.....75c.

The Dynamo, How Made and How Used. By S. R. BORTONE. Eighth edition, with additional matter and illustrations. 12mo, cloth.....\$1.00

Dynamos, Alternators and Transformers. By G. D. KEMP. Giving an exposition of the general principles underlying the construction of dynamo-electric apparatus without the use of high mathematics and complicated methods of investigation. 12mo, cloth.....\$4.00

The Plumber and Sanitary Houses. By S. S. HELLIER. 5th edition. Royal 8vo.....\$5.00

Plate Girder Construction. By ISAMI HIROI, C. E. Revised Edition. 16mo, cloth. New York, 1893 (Van Nostrand's Science Series No 95).....50c.

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, PUBLISHER & BOOKSELLER

96-102 READE ST., NEW YORK.

HELP WANTED.

Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

SALESMAN with experience and trade in hardware and cutlery in New York and Penna. Address, with references and full particulars, "TRADE," No. 1221, office of *The Iron Age*, 96-102 Reade St., New York.

SALESMEN visiting hardware trade to sell as a side line on commission our Unique Self Heating Hair Curler; it sells equally as well to the following dealers: Druggists, Jewelers, Bazaars, Dry Goods, News Stands, etc. Address, with references, **UNIQUE NOVELTY CO.**, 99 to 103 Abbot St., Detroit, Mich.

SALESMAN in every large town to sell a staple line of hardware on commission. Address "EDWARDS," care E. S. Adams, office of *The Iron Age*, 312 The Cuyahoga, Cleveland, Ohio.

SALESMEN to sell on commission to the hardware, plumbing and rubber trade the best and cheapest line of lawn sprinklers made; see advertisement in this paper. Address **ETRE & HENGER MANUFACTURING CO.**, St. Louis, Mo.

A FEW RESPONSIBLE PARTIES for the States of Pennsylvania, Maryland, Illinois, Ohio, Vermont, Massachusetts and Maine, to sell our high grades of Babbitt Metal and Solder, either on commission or as jobbers. Apply to the **SYRACUSE SMELTING WORKS**, Syracuse, N. Y.

SITUATIONS WANTED.

Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

AS MANAGER for a general store; advertiser is 42 years of age, with 25 years' valuable experience in dry goods, groceries and office work; the highest references as to character and ability; hold position as bookkeeper in grocery house, but desire to change as above. "ROTHERFIELD," office of *The Iron Age*, 220 S. 4th St., Philadelphia, Pa.

BOOKKEEPER—A young man, 38 years of age, with 20 years' experience as manager and bookkeeper, desires a position where ability is necessary; is well versed in the iron business; am able financier and a thorough accountant and will furnish the best of references; willing to go to city or country. Address "BOOKKEEPER," office of *The Iron Age*, 220 So. 4th St., Philadelphia, Pa.

A MANUFACTURER'S TRAVELING SALESMAN, with several years' experience, and established trade in four states, now representing two good lines, would like to add one or two additional lines; competent to handle anything in hardware or cutlery; a chance to secure good representation at reasonable cost. Address "ACTIVE," office of *The Iron Age*, 22-24 Pickering Building, Cincinnati, O.

AS TRAVELING SALESMAN or manager of a retail hardware business, by advertiser, who is 28 years of age; married; eight years' road experience, about same amount inside; highest references. Address "ELM," Black Rock Station, Buffalo, N. Y.

BY A TRAVELER thoroughly acquainted, anything in the hardware or metal line to sell in the principal cities through the West on salary or commission. Address "N.," No. 1228, office of *The Iron Age*, 96-102 Reade St., New York City.

GENERAL MANAGER of one of the largest machine works, with many years' experience, is open for engagement in a similar capacity; references of the highest character given and requested. Address "GENERAL MANAGER," office of *The Iron Age*, 22-24 Pickering Building, Cincinnati, Ohio.

BY A FIRST-CLASS BUSINESS MAN, with 15 years' practical experience as a rolling mill manager; thoroughly competent, and of the highest character; will be open for an engagement about February 1; is now engaged with large concern, but for satisfactory reasons desires to change. Address "GENERAL MANAGER," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

AGENCY WANTED for salable hardware specialties by one well acquainted in the trade; best references; terms satisfactory to manufacturer. **H. B. JAMES**, P. O. Box 3072, New York.

BY A PRACTICAL steam goods salesman—some specialty to sell as a side line. Address "T. B.," office of *The Iron Age*, 96-102 Reade St., New York.

BY A TRAVELING SALESMAN in Builders' and general hardware; has extensive acquaintance in New York State, New Jersey and New England; can figure from plans and specifications; three years on road; can furnish first-class references. Address "BUILDERS," No. 1228, office of *The Iron Age*, 96-102 Reade St., New York.

BY CHEMIST experienced in iron and steel analysis and accustomed to general work outside laboratory, conducting tests, etc.; highest references. Address "EXPERT," Box, 1228, office of *The Iron Age*, 96-102 Reade St., New York.

MANUFACTURERS of leading goods who desire first-class representation to the wholesale and jobbing trade of the West and Northwest are respectfully invited to correspond with "SELLING AGENT," office of *The Iron Age*, 96-102 Reade St., New York.

MR HENRY MOORE of Woolley, Baynon & Moore Co. will withdraw from that firm January 1, '94, and solicits correspondence from manufacturers of heavy and shelf hardware with a view to represent them in New York City; has a good connection and will travel occasionally. Address "HEAVY AND SHELF," Box 1228, office of *The Iron Age*, 96-102 Reade St., New York.

A STRICTLY first-class builders' hardware salesman desires to make a change February 1st; acquainted with different factories' goods; can figure from architects' plans and specifications; can give first-class references; position in house or on road; seven years with present house. Address "B. H. SALESMAN," office of *The Iron Age*, 96-102 Reade St., New York.

BY A YOUNG MAN of twenty years' experience in the iron business, as representative agent, or to sell goods on the road; is a thorough mechanic, energetic and industrious; will be valuable to the party wishing good service. Address "P. L. S.," office of *The Iron Age*, 220 South 4th St., Philadelphia, Pa.

BY A CUTLERY SALESMAN who has traveled many years representing some first-class houses in pocket and table cutlery, imported hardware, chains, etc.; well known to the jobbing trade throughout the United States; will be open for an engagement after January 1st; references unexceptionable. Address "W. H. G.," No. 1221, office of *The Iron Age*, 96-102 Reade St., New York.

BY A BOOKKEEPER of over 20 years' experience, a position as bookkeeper and cashier with a first-class wholesale house; best of references. Address "E. B.," Box 5006, N. Y. P. O.

WHERE MY BUSINESS experience of several years in steel and iron and railroad supplies can be utilized to mutual advantage. Address "MAN," office of *The Iron Age*, 220 S. 4th St., Philadelphia, Pa.

AS GALVANIZING FOREMAN, by young man; ten years' experience with large English and American houses; open to lay down and work modern plant for light and heavy sheet iron for working up and corrugating. Address "GALVANIZING," No. 1221, 96-102 Reade St., New York.

AS BOOKKEEPER or **SALESMAN** in iron or steel house, by a young man with seven years' experience; references of the highest character. Address "TEMPERATE," office of *The Iron Age*, 96-102 Reade St., New York.

TO REPRESENT MANUFACTURERS of hardware; have an intimate acquaintance with all the large buyers of the Northwest, West, South and East, with the exception of New England States; have had many years' experience and can furnish first-class references. Address "NORTHWEST," office of *The Iron Age*, 59 Dearborn St., Chicago.

SUPERINTENDENT OR CHIEF ENGINEER, by a mechanical engineer of 15 years' experience in general engineering, hydraulics, cranes, sheet, plate and structural iron work, etc.; any one who wants an energetic man to look after his interests will answer this ad. "HUSTLER," office of *The Iron Age*, 96-102 Reade St., New York.

A GENTLEMAN who has had over 25 years' experience in hardware and kindred lines, and who also has had a thorough business training in accounts, finance, etc., desires to secure a position as representative in New York City of a manufacturer of hardware, metals, iron, etc., or to serve in any capacity where he may be useful; unqualified references furnished. Address Box No. 1214 A., office of *The Iron Age*, 96-102 Reade St., New York.

WOULD LIKE to secure position with manufacturer of hardware or commission hardware house as representative on road or house position; having been a number of years in the business, with a road experience of six years, feel confident I can make myself valuable to any company; can furnish excellent references. Address "ENERGY," P. O. Box No. 182, Baltimore, Md.

A MEMBER OF AMERICAN SOCIETY of Mechanical Engineers, who has had 20 years' practical experience as follows: machinist, head draughtsman, erector of steam plants engineering, estimating, contracting and office work and superintendent of large engine works, is available for responsible position. Address "A. B. C.," office of *The Iron Age*, 59 Dearborn St., Chicago.

BY AN EXPERIENCED HARDWAREMAN, ten years' experience, three years' on the road; good salesman and stock keeper; West or Southwest preferred; best of references. Address **L. W. VIVION**, Benton City, Mo.

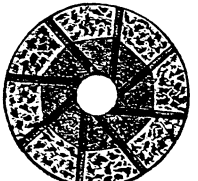
THE BOND NAIL.

These nails are made from different sizes of wire with head at any desired position between the points. For coopers, box and furniture manufacturers' dowels they are unsurpassed. Builders and repairers of all kinds will find these nails useful. We also manufacture Doweling Machines and Sets for driving these nails. Address

THE BOND NAIL CO.,

P. O. Box 23, RAYNHAM, MASS.

Patent ROCK EMERY MILL STONES.

Next to		Made to
Diamonds		Fit Any
in		Mill Frame
Hardness and Durability.		without change.

Cuts every substance with unexampled rapidity; always sharp; emery face Never Dressed. As much more Durable than other stones as they are Harder. Never Glaze; grind everything. Most Rapid Grinder known.

Send for Circular.

STURTEVANT MILL CO., Boston, Mass.

IF YOU WANT**A NIAGARA DYNAMO OR MOTOR**

or if you are a dealer and want an Agency send for our Catalogue and Price-List.

LOYELL MFG. CO., LTD., ERIE, PA.



The Scattergood Time Record and Pay Roll Book.
(Pat. Oct. 13, 1891.)

Address for Circular to
HENRY W. SCATTERGOOD,
23 Richmond St. Phila., Pa.

J. POPPING'S Patent Machine & Tool Wks.



MANUFACTURERS OF
Solid Iron Shoulder Rabbet Planes, etc., etc.
and Hofstatter's Patent Hair Picking machine.
N. E. Cor. 58 St. and 11th Ave., N. Y.

THE STEEL AND IRON IMPROVEMENT CO.,

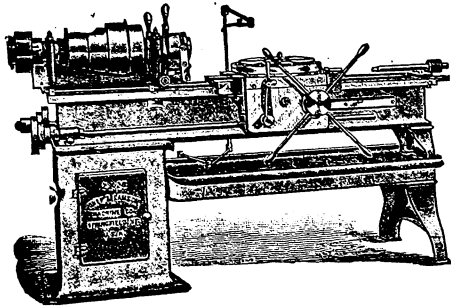
Controlling the Adams-Blair Process and other Steel and Iron Patents.

High Grade Open Hearth Steel produced by the Adams-Blair Process at less than the Cost of BESSEMER Steel.

91 and 93 Fifth Ave., Pittsburgh, Pa.

EASTERN OFFICE: 412 Drexel Building, Philadelphia, Pa.

HAVE YOU A
FLAT TURRET LATHE ?

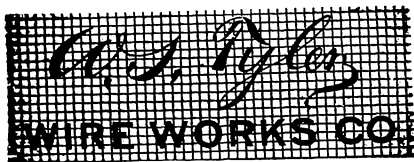


If not send or

RAPID LATHE WORK

JONES & LAMSON MACHINE CO.,

SPRINGFIELD, VT., U. S. A.



MANUFACTURERS OF

Improved Revolving Mining Screens,

For Coal, Ores, Phosphates, Etc.

Also Tipple Screens and Yard Screens. Extra Heavy Double Crimped Mining Cloths, of every description.

W. S. TYLER, Pres. PRCTOR PATTERSON, Sec. and Treas.
CLEVELAND, OHIO.

ANALYTICAL AND ASSAY **LABORATORIES**

—OF—
DR. GIDEON E. MOORE

221 PEARL ST., (Corner Platt St.) NEW YORK.

Assays of Ores, Metals and Metallurgical Products of every description. Analysis of Water, Ores, Minerals, Metals, Fuel, and Natural and Industrial Products generally.
PRINTED PRICE-LIST ON APPLICATION.

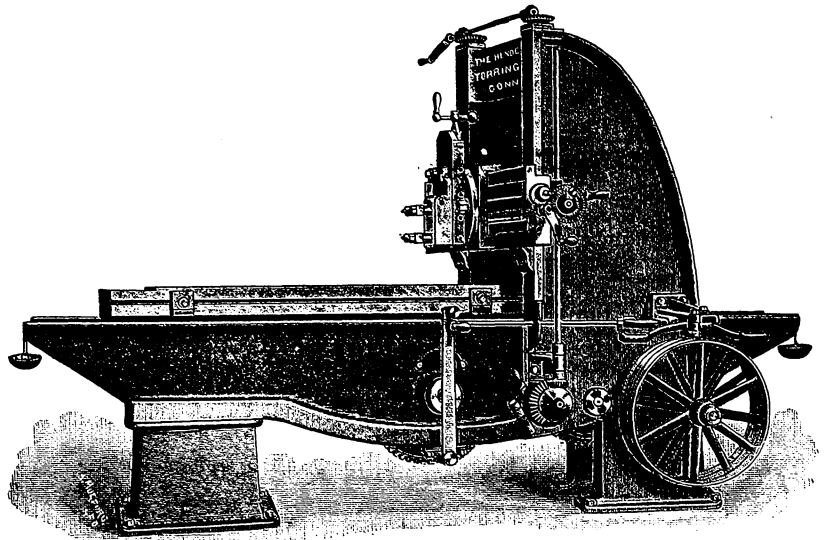
ALUMINUM.

The Pittsburgh Reduction Co.,

116 Water St., Pittsburgh, Pa.,

Offer Aluminum guaranteed equal in purity to the best in the market, at lowest rates obtainable.

ALUMINUM SHEET, WIRE, AND CASTINGS.



Iron Planers at Reduced Prices.

We have on hand a few new planers of this pattern, and in order to dispose of them quickly, we would make a good reduction in price of same. The sizes are 16 inch, 22 inch, 24 inch and 27 inch. If you are in need of a good planer write us for prices on these.

The Hendey Machine Co., Torrington, Conn.

DO YOU BORE CYLINDERS?

THE HORIZONTAL BORING MACHINE



IS A SPECIAL TOOL FOR THIS PURPOSE.

SEND FOR PARTICULARS TO

NEWARK MACHINE TOOL WORKS

NEWARK, N. J.

J. A. FAY & Co., CHICAGO, WESTERN AGENTS.

S	TEARNS		S
T	<p>All that a perfectly constructed Bicycle should be the STEARNS will be in 1894, as it was in 1893. The latest improvements and modifications have had the severest of practical tests. As delivered to the rider it is guaranteed for a year.</p>		
E	<p>E. C. Stearns & Co., Syracuse, N. Y.</p>		
A			
R			
N			
S	TEARNS		S

ARE YOU HERE TO MAKE MONEY?

IF SO, THE PRICES WE ARE MAKING ON
OIL HEATERS AND GAS STOVES

WILL INTEREST YOU.

B. & B. Stoves are the Leaders.

B. & B. Combination Oil Heaters and Cook Stoves are a great success, as proven by the many testimonials received from all parts of the country.

Every Stove is mounted on rollers, and can easily be moved from room to room. They can be used in place of a range in the kitchen or in place of a base-burner in the parlor. They are thoroughly well adapted to fill all requirements, combining as they do all the qualities of a first-class Oil Heater and an elegant Parlor Cook Stove.

If you happen to have one of them upstairs, the tank can easily be removed and taken down to the kitchen to be filled, and again replaced in the Stove.

Those who have used the old style Stove with tanks fastened in them as tight as if cast in the iron will appreciate this feature. They can be fitted with our 2-hole, 3-hole or 4-hole Extension Tops for regular 8-inch ware. We want your trade, and if you will give us a chance to quote you prices we will have it.



ASK FOR OUR NEW 80-PAGE CATALOGUE.

W. W. MONTAGUE & CO., San Francisco, General Agents for the Pacific Coast.

The Glazier Stove Co., Mfrs., CHELSEA, MICH.



The standard by which the merits of a Freezer are gauged is, how near it comes to being as perfect as the

WHITE MOUNTAIN ICE CREAM FREEZER.

It always has been, and is still, the best. Try them.

Manufactured by The White Mountain Freezer Co., Nashua, N. H.



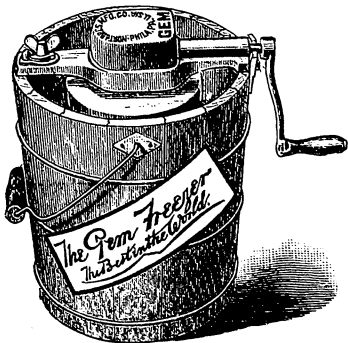
THE OLD RELIABLE STANDARD FREEZER

has the reputation of being the BEST ICE CREAM FREEZER ever introduced. STRENGTH, DURABILITY, NEATNESS AND EFFICIENCY are prominent points in the manufacture. Full Size Can, CEDAR TUB, Detachable Hinged Crossbar, Self-adjusting Vibratory Scraper, etc.

Write for Illustrated Circular, Price-List and Discounts of STANDARD, GOOD LUCK, MODEL and MACHINE Freezers.

CHAS. W. PACKER, Mfr.,
20 North Fourth Street, Philadelphia.

ICE CREAM FREEZERS with ELECTRIC WELDED WIRE HOOP PAIS.



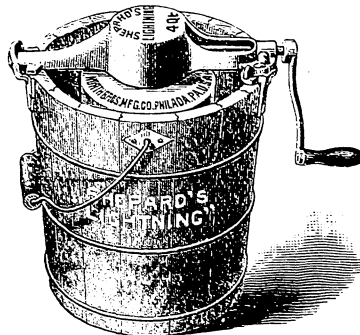
This season we maintain our established reputation as leaders of all improvements in Ice Cream Freezers, and of making the best goods in the market. In adopting, for our entire line, the ELECTRIC WELDED WIRE HOOP PAIS, the hoops of which are twice as strong as the old flat hoops, and are guaranteed not to fall off, we have taken a step in advance of all others. All our pails are made of the Best Virginia White Cedar. All inside parts of Freezers are thoroughly coated with Pure Block Tin. Materials and workmanship are of the very best.

With the acquirement of the Freezer business of the Shepard Hardware Co., we have now the largest, best and most popular line of Freezers in the market. Prices Right.

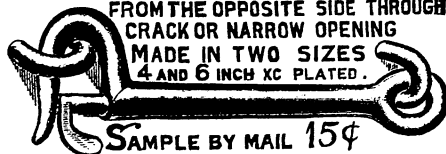
DISCOUNTS QUOTED ON APPLICATION.

Manufactured by

NORTH BROS. MFG. CO., PHILADELPHIA, PA.



**COVERT'S SELF-LOCKING,
GATE AND DOOR HOOK.**
POSITIVELY PREVENTS BEING UNHOOKED
FROM THE OPPOSITE SIDE THROUGH
CRACK OR NARROW OPENING
MADE IN TWO SIZES
4 AND 6 INCH XC PLATED.



SAMPLE BY MAIL 15¢

Call for Our Banner Bolt Snap:

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substance and freezing, and is lower in price.

Made in all sizes; Round, Loop and Open Eye. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

Covert's Saddlery Works,

FARMER, N. Y., U. S. A.

Hardware Dealers Can Profitably SELL BICYCLES.

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

COLUMBIAS

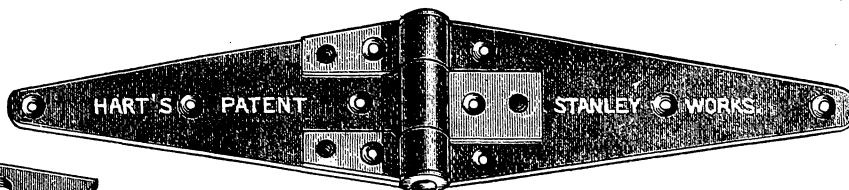
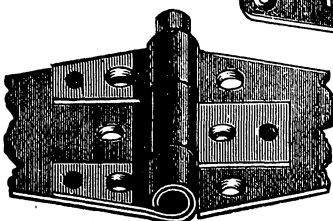
Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

We want enterprising agents of good standing and solicit correspondence.

Pope Mfg. Co.,

221 Columbus Ave.,
Boston, Mass.

HART'S PATENT HEAVY STRAP HINGES.



It will be noticed that two thicknesses of iron surround the pin throughout its length and extend back upon the straps of the hinge, thus giving double thickness of iron at the points where most needed, and more than double the strength of an ordinary strap hinge. The short or inside leaves are galvanized, thus insuring easy working joints, and preventing breakage on account of rust.

—MADE BY—

THE STANLEY WORKS, NEW BRITAIN, CONN.
79 CHAMBERS ST., N. Y.

CLARK'S BEST QUALITY SCREW DRIVERS.



Four Drivers and one Handle; all interchangeable; are hardened and tempered all over; made of best stock, and finished first-class.

FOR SALE BY ALL HARDWARE DEALERS.

MANUFACTURED BY

R. H. BROWN & CO.

NEW HAVEN, CONN.

*You take no risk on the quality.
We make only the best!*



**Sand
Papers**

IN
Reams and Rolls

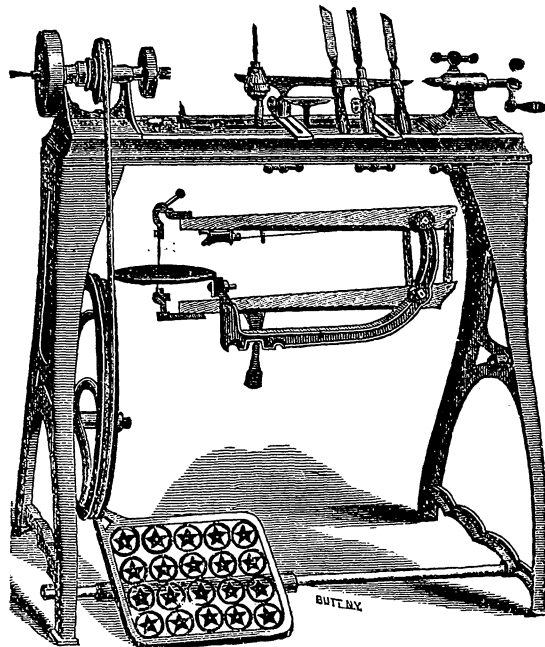
Flint Paper
Garnet Paper
Emery Paper
Emery Cloth

HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

BAEDER, ADAMSON & CO.

730 MARKET STREET, PHILADELPHIA.
67 BECKMAN STREET, NEW YORK.
143 MILK STREET, BOSTON.
182 LAKE STREET, CHICAGO.

HOLIDAY GOODS.



Many kinds of Scroll Saws have been put on the market by ourselves and other manufacturers during the past twelve years. Of these only a few have proved good enough to remain in demand. The call now is for a well-made, practical machine, and all second-class ones are of slow sale.

Those who want a good Lathe with Scroll-Sawing Attachment and all Tools and Improvements to the very latest moment will buy the Goodell Lathe.

Those who want only a Scroll Saw with Drilling Attachment and Rubber Blower will prefer the Rogers Saw.

These two machines are taking the place of all others, and are now the most in demand throughout the world.

No dealer can make a mistake by laying in a stock of them. About Christmas time they are wanted in every town, and will make business lively at this otherwise dull season.

We also keep a full stock of Designs, Wood, and all other Scroll Sawing goods.

Price of Goodell Lathe, complete, \$12.00.

Price of Rogers Saw, complete, \$3.50.

MILLERS FALLS CO.,

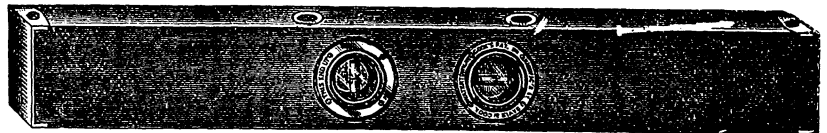
No. 93 Reade Street, New York.

Palmer's Common Sense Frame Pulley.



MANUFACTURED BY

PALMER HARDWARE MFG. CO., Troy, N. Y.



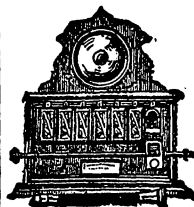
COOK'S PATENT LEVEL.

Made in Wood and Iron. Every Level Fully Guaranteed.

Inquire at your nearest hardware store for them. If not in stock, send to

TAKE NO OTHER.

DAVIS & COOK,
WATERTOWN, N. Y.



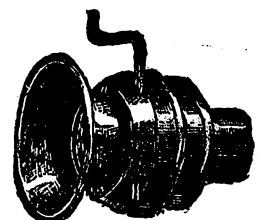
W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK,

Manufacturers of

SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC MECHANICAL AND PNEUMATIC ANNUNCIATORS AND BELLS.

Complete outfits of Speaking Tubes, Whistles Electric, Mechanical and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, DeKalb ave. near Knickerbocker Brooklyn, N. Y.



CABINET LOCKS

OF EVERY KIND.

DRAWER LOCKS,

CUPBOARD LOCKS,

WARDROBE LOCKS,

CHEST LOCKS,

DESK LOCKS.

A complete line of more than 1000 list numbers exclusive of our old and complete line of

YALE CABINET LOCKS.

THE YALE & TOWNE M'F'G CO.,

STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburg. San Francisco.

THE DEALER who sells what
THE PEOPLE ask for

MAKES FRIENDS and MONEY, and
SAVES TIME and TROUBLE.

The people ask for

LePage's Liquid Glue,

And the people are right.

It is the strongest and best glue made. It has been imitated, but never equalled. Be sure to get what you order and ACCEPT NO SUBSTITUTES.

Our name is on every label

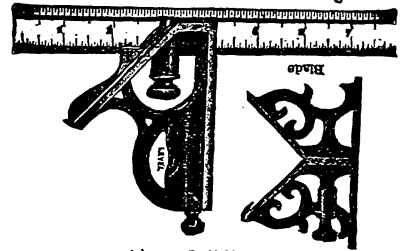
RUSSIA CEMENT CO.,

GLOUCESTER, MASS.

New York Office, 95 Reade and 113 Chambers Streets.

Pacific Coast Office, 23 Davis Street, San Francisco, Cal.

CHAPLIN TRY AND CENTRE SQUARE.



Also a full line of

MACHINISTS' FINE TOOLS.

If you haven't our 1893 catalog send us a postal card.

STANDARD TOOL CO.,

ATHOL, MASS., U. S. A.

ATHOL MACHINE CO., Selling Agents.

NONPAREIL Ratchet Wrenches.

Made of best forged Tool Steel; are easily and readily adjusted and controlled. Can be made reversible instantly without removing from their work by throwing over the lever in slot of the handle.

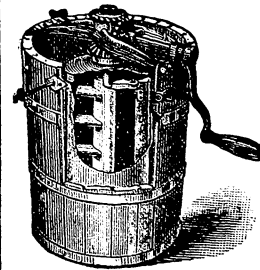
The Set of Combination Tools No. 1 includes the wrench, two sockets, one for screw-driver, bit or reamer shank, with wood handle, and one socket



H
for drill shank and feed nut. The jaws on this wrench open from 3-16 to 1/4 inches.

Send for Illustrated Circular and Price-list of various sizes

The Keystone Mfg. Co.
312 Terrace, Buffalo, N. Y.



"Home" Freezers,
2 to 10 quarts.

"Rapid" Freezers,
2 to 40 quarts.

"Rapid"
Ice-Breakers,
4 sizes.

Sundry Ice-Cream
Apparatus.

"RAPID."

Send for Descriptive Catalogue and Attractive Quotations.

CLEMENT & DUNBAR,
No. 1129 Beach St., PHILADELPHIA.

Manufacture To Order
SPECIALTIES & NOVELTIES, PATENTED ARTICLES.
HARDWARE GOODS ETC., SMALL OR FINE MACHINERY.
SEND FOR CATALOGUE - CORRESPONDENCE SOLICITED
OTTO KONIGSLOW CLEVELAND, O.

W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

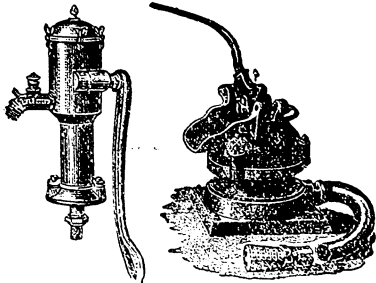
DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY AND EASY WORKING PUMP FOR Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 209.

Fig. 381.

Fig. 145.



or wherever it is desired to raise a large quantity of water by hand power.

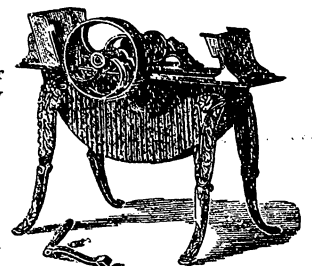
The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4 500 gallons per hour.

These pumps are simple, durable and low priced. Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.



C. I. Grindstone Frame.

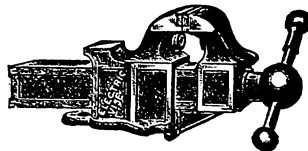
THE DEMING CO.
FACTORY SALEM O. U. S. A.
MANUFACTURERS OF
HAND & POWER PUMPS, WELL SUPPLIES & C. VERTICAL STEAM PUMPING ENGINES.
ARTESIAN WELL CYLINDERS, HYDRAULIC RAMS.
N. Y. OFFICE: 72 JOHN ST.
NEW YORK & HUBBELL
GEN'L WESTERN AGT: 55 & 57 N. CLINTON ST. CHICAGO, ILL.

F. E. MYERS & BRO.

WORLD'S PUMPS
LARGEST PUMP WORKS EXCLUSIVELY UNITED STATES
ASHLAND, O.
+ CATALOGUES FREE +
Ashland Pump and Hay Tool Works.

The New York Safety Dumb Waiter.
"The Manhattan Dumb Waiter."
"The Improved Humphrey Hand Elevator."
Made specially to be sold by Hardware Stores.
Thousands in use. Catalogues on application.
THE STORM MANUFACTURING CO.
NEWARK, NEW JERSEY.
Formerly of Poughkeepsie, New York.

VISE.

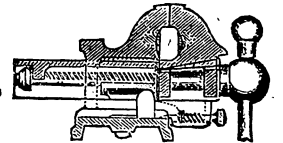


Patented Dec. 27, 1892.

IT HAS QUALITIES THAT ARE UNDISPUTED.

Rapid, Active, Prompt.

One movement in and out, one turn of the hand and the work is secured.



The Capital Machine Tool Co., AUBURN, N. Y.

PRENTISS' PAT. VISES.

The Leaders for 20 Years

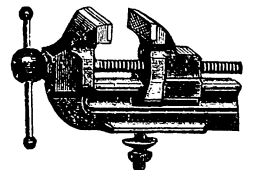
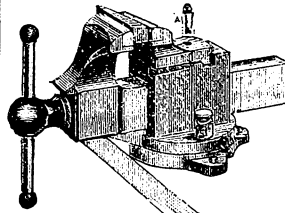
Send for Illustrated Catalogue of

ALL KINDS OF VISES.

PRENTISS VISE COMPANY,

MANUFACTURERS,

44 Barclay St., New York.



SHARP TOOLS are a NECESSITY to a good workman,

But without a GOOD WHETSTONE they are an impossibility

That is why it is always economy to buy

PIKE'S WHETSTONES.

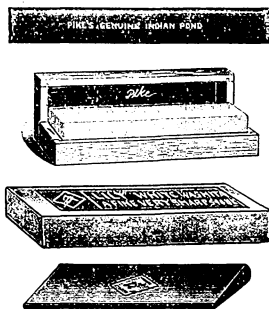
Pike's Indian Pond Scythe Stone, Strong, Sharp Grit, Quick Cutting.

Scythe Stones.

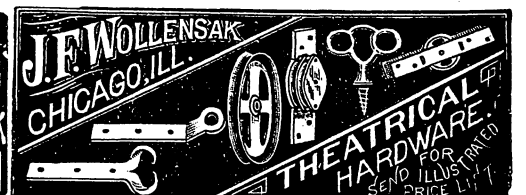
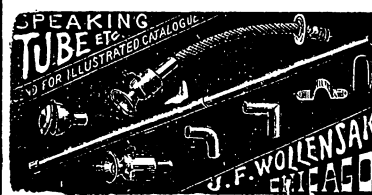
Oil and Water Stones.

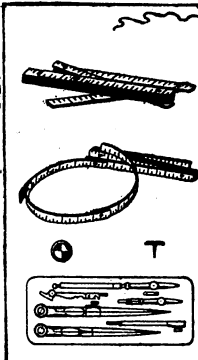
GREEN MOUNTAIN, LAMOILLE, BLACK DIAMOND, PREM. QUINNEBAUG, WHITE MOUNTAIN, GENUINE RAGG, WILLOUGHBY LAKE.

WASHITA, ARKANSAS, HINDOSTAN, WATER OF AYR, RAZOR HONES, TABLE HONES, AXE STONES, ETC.



THE PIKE MFG. CO., - Pike Station, N. H.





KEUFFEL & ESSER CO.

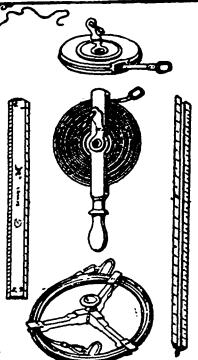
NEW YORK.
BRANCH: CHICAGO.
FACTORIES: HOBOKEN, N.J.

MANUFACTURERS OF EXCELSIOR MEASURING TAPES.
SUPERIOR QUALITY, LATEST IMPROVED. GREATEST VARIETY.
STEEL METALLIC LINEN POCKET TAPES.
EXCELSIOR BAND CHAINS FOR SURVEYORS, LAND CHAINS, &c.

K & E CO FOLDING POCKET RULES.
NO WARPING, NO SHRINKING, NO ILLEGIBLE JOINTS, NO BULK.
2 3.4 5.6 8 FOOT, ALSO WITH PATENT SPRINGS.

FLAT & TRIANGULAR BOXWOOD SCALES, BEST MADE.
PLUMB BOBS, THUMB TACKS, DRAWING INSTRUMENTS.

PRICE LISTS & QUOTATIONS PROMPTLY SENT.



AZTEC COIN METAL

MADE INTO SPOONS AND FORKS.

Spoons and Forks of this metal combine all the following desirable features:
LOW PRICE, DURABILITY, UNIFORMITY AND STRENGTH.



QUETZAL PATTERN.
(NEW.)

MANUFACTURED ONLY BY

THE HOLMES & EDWARDS SILVER CO.,

Bridgeport, Conn.

AZTEC COIN METAL
has no plating to
wear off. Made
of solid metal.
Easily kept clean.

IRON INSTEAD OF WOOD.

**GALVANIZED IRON
TUBING and CURB,**

FOR
CHAIN PUMPS,
(Kegler's Patent)

Are Giving Universal Satisfaction,
BECAUSE:

They do not rust and accumulate filth—always clean. Extreme lightness is combined with strength and durability. No freezing. No waste of water by reason of enlarged reservoir at top of tubing. No annoying wheel at bottom. Easy to handle.

Tubing weighs less than 1/4 lb. per ft., is connected by couplings and can be attached to any make of curb.

Send for Catalogue.

Bellevue Pump Co., Bellevue, Iowa.

"RELIABLE"
Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

LUFKIN RULE CO., Saginaw, Mich.

**COLUMBIA
STEELWIND
MILL**

New in Principle.
Beautiful in Appearance.
Powerful in Operation.

Contains covered **Internal Gear**. Unequaled in the line of Pumping Wind Mills. We solicit the closest investigation. Also Columbia Steel Derricks, Iron Turbine Wind Engines, Buckeye Force & Lift Pumps, Tank and Spray Pumps, Buckeye and Globe Lawn Mowers, Iron Fencing, Cracking, Etc. Write for circular.

MAST, FOOS & CO., SPRINGFIELD, O.

BERGER BROS.
Manufacturers of
TINNERS' HARDWARE.
Berger's Celebrated Pail Bars, Sauce Pan Handles, Eave Trough Hangers, Pipe Fasteners, Hooks, Straps and Barrel Trucks, &c., &c. Send for Prices and Catalogue.

237 ARCH ST.,
Philadelphia, Pa.

Skilled mechanics prefer them Live dealers sell them

STARRETT'S

Best in workmanship
Finest in finish
Latest in improvements

For all workers in metal or wood
Every tool warranted satisfactory

FINE TOOLS

Send for Catalogue L. S. Starrett, Athol, Mass.

GEO. N. CLEMSON, Pres.

LOUIS DUHME, Vice-Pres.

ROBERT J. JOHNSON, Treas.

F. B. EARLE, Sec.

The National Saw Co.,

OPERATING

Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y. Woodrough & McParlin, Cincinnati, O. Woodrough & Clemson, Boston, Mass. Monhagen Steel Works, Middletown, N. Y. Richardson Brothers, Newark, N. J. Harvey W. Peace Co., Brooklyn, N. Y. Pennsylvania Saw Co., Philadelphia, Pa.

GENERAL OFFICE

96 & 98 READE ST.,

NEW YORK.

SAWS

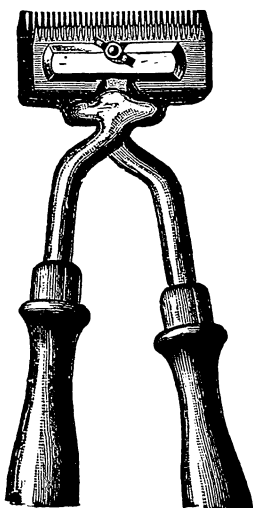
BUSINESS ESTABLISHED
1798.INCORPORATED
1891.

JOS. F. McCOY CO.,

26 Warren St., New York,

Headquarters for

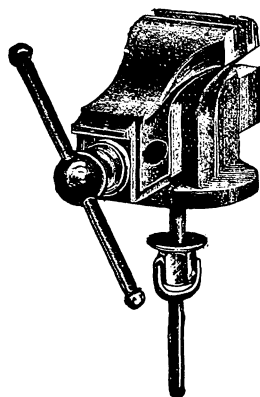
Coates' Horse Clipper



AND
Barber
Clippers.

ALSO
THE "BELL"
AND
THE "COMET"
Horse
Clippers.

At prices to suit
the times.

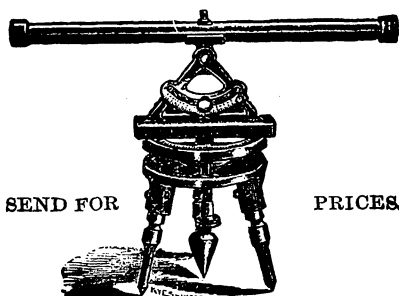


HOLLANDS'
OFFSET JAW
VISE.

Specially adapted
for drill press work
where chucks can
not be used and
equally good for
special or regular
bench work.

Hollands Mfg. Co.,
ERIE, PA.,
Manufacturers all
styles VISES.

ARCHITECTS' & CARPENTERS' TRANSIT,

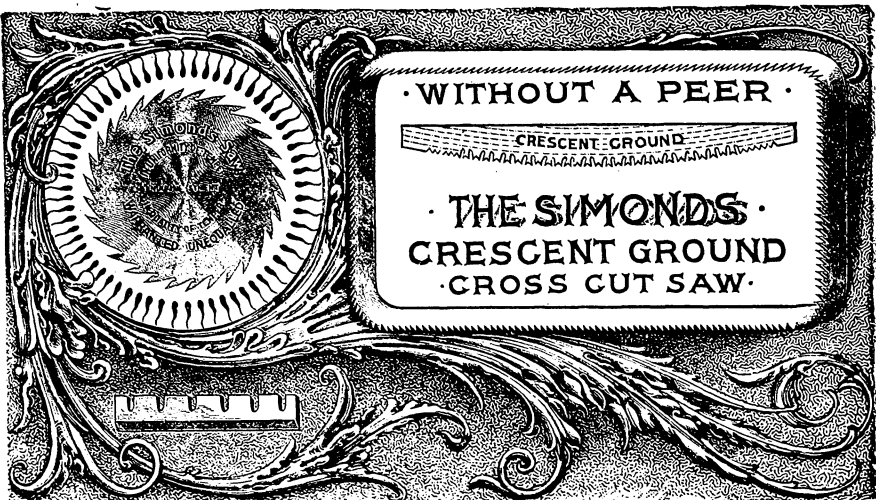


SEND FOR

PRICES.

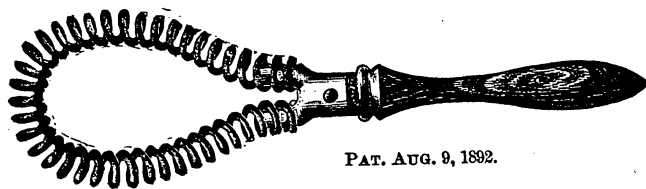
C. F. RICHARDSON & SON, Athol, Mass.

Manufacturers of Iron Levels
and Leveling Instruments.



Simonds Mfg. Co. Simonds Saw Co.
FITCHBURG, MASS. CHICAGO, ILL. SAN FRANCISCO CAL. PORTLAND, ORE.

THE BOSS DUST BEATER.



PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

Retail Price, 25 Cents. Sent by Mail, 35 Cents.

PEABODY & PARKS,
Manufacturers, TROY, N. Y.

The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

For Prices and Discounts, address

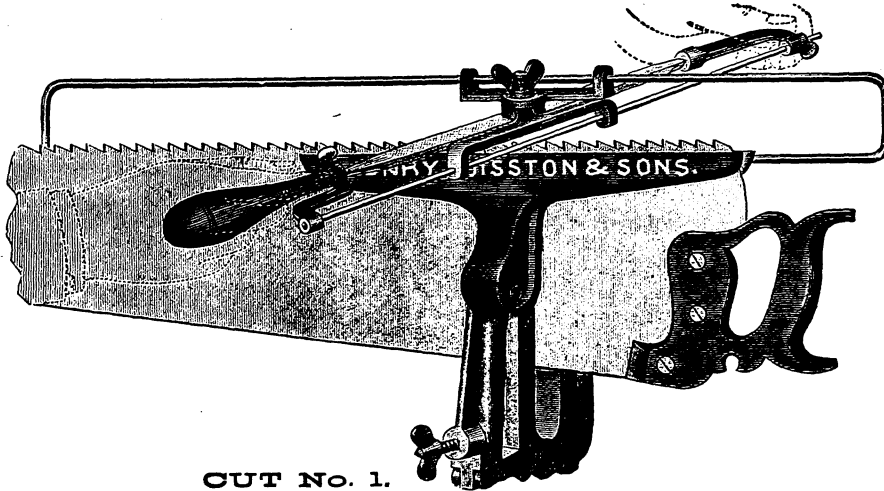
WIEBUSCH & HILGER, LTD., SOLE AGENTS,
84 and 86 Chambers Street, NEW YORK.

BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.

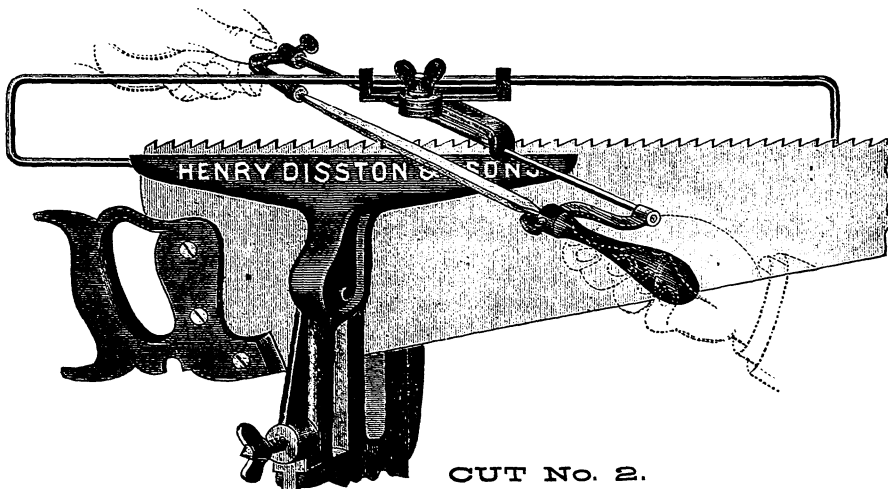
DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT NO. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT NO. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete. Packed one in a wooden box.

Henry Disston & Sons, Philadelphia, Penn. INCORPORATED,

Samuel W. Allerton, Pres.

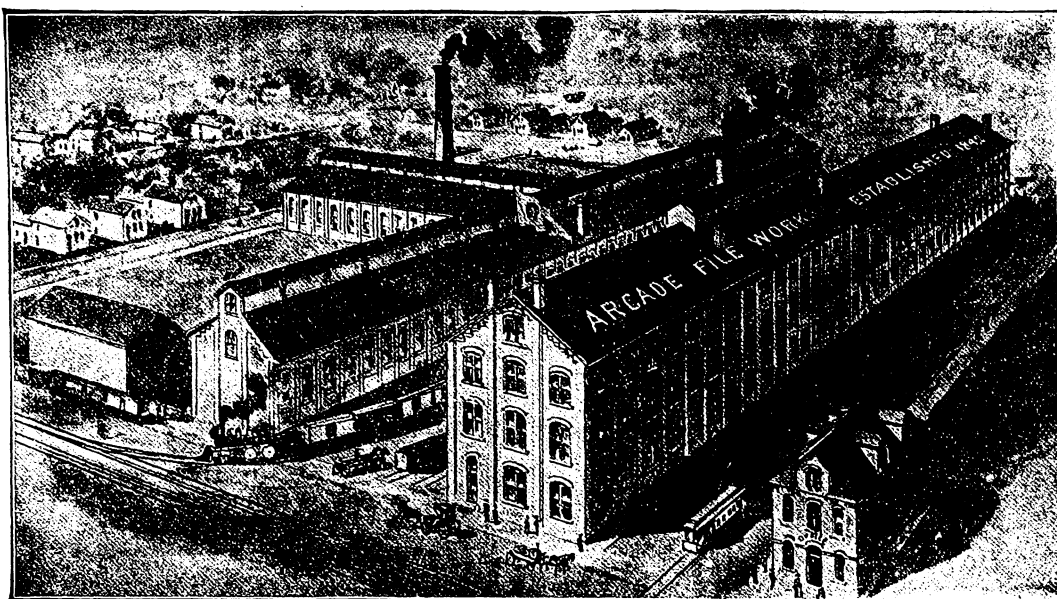
Courtlandt C. Clarke, Sec. and Treas.

Alfred Weed, Vice-Pres. & Gen. Manager.

ARCADE FILE WORKS.

ESTABLISHED 1842.

Eastern Office and Warehouse,
83 READE STREET, NEW YORK CITY.



Western Office and Warehouse
23 LAKE STREET, CHICAGO, ILL.

Works: ANDERSON, IND.

THE FILES THAT LEAD THEM ALL.

THE BEST EQUIPPED FILE WORKS IN THE WORLD.

The fact that we alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables us to produce a file that will cut faster and wear longer than any on the market.

THIRD REVISED EDITION.

THE IRON AGE STANDARD HARDWARE LISTS

FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

Saucepans and Round Boilers.

Pints.	Plain	Turled.	Tin'd or En'd.
1	\$0.30	.35	.39
1½	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2½	1.05	1.18	1.56
3	1.20	1.35	1.70

The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by ½ inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Wrenches.

Standard List.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

Stove Hollow Ware.

Ground and Unground.

POTS, KETTLES, ETC. (CAST IRON.)

No.....	6	7	8	9	10	11
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75
Kettles.....	.55	.65	.70	.85	1.00	1.40
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.30	.35	.40	.50	.60
Griddles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....

SCOTCH AND YANKEE BOWLS.

No....	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

Glue Pots.

Tinned or Enamelled

No.	4/0....	\$4.50	No. 2	....	\$8.40
3/0....	5.00		3	....	10.26
2/0....	5.50		4	....	12.42
0	6.00		5	....	14.58
1	6.75		6	....	16.94

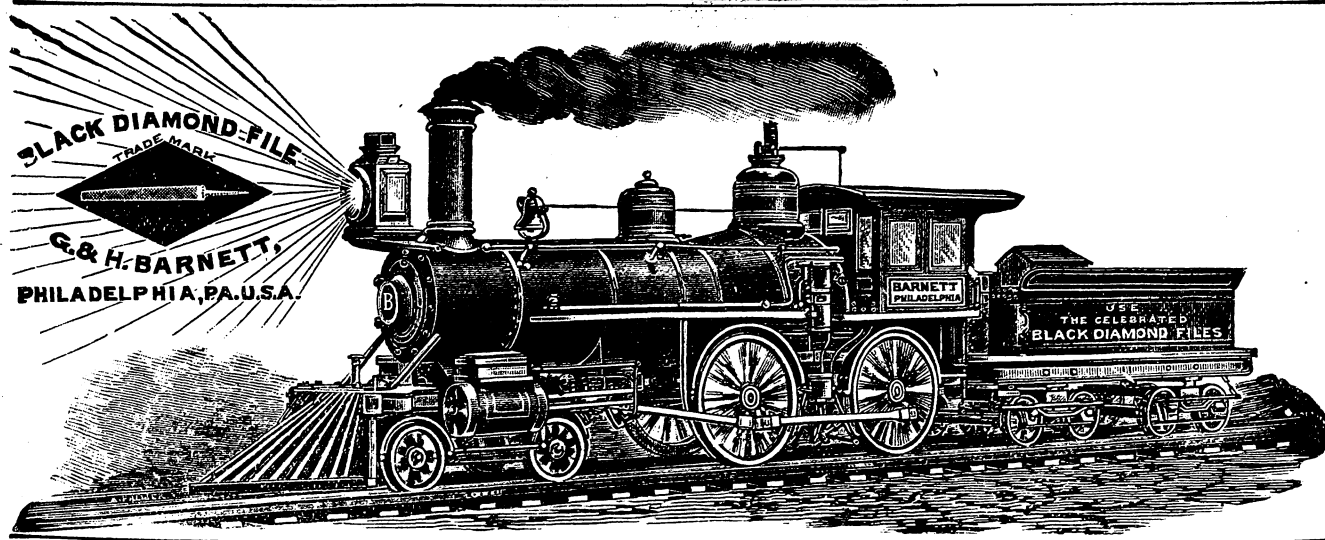
and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.

That the Standard Hardware Price Lists meet a want of the trade is evident from the fact that a Third edition is already called for.

EVERY HARDWAREMAN SHOULD HAVE A COPY. Price 25 cts.

Sent, postpaid, on receipt of Price, by

DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, N. Y.



THE LARGEST AND MOST COMPLETE FILE WORKS IN THE WORLD.

NICHOLSON FILE CO.

PROVIDENCE, R. I.

3000
VARIETIES FILES
[X.F.] AND INCREMENT CUT FILES

J. M. KING & CO.,
WATERFORD, N. Y.

Manufacturers of
BUTTON'S



**Pat. Wire Cutter
AND PLIER COMBINED.**

Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' and
MACHINISTS' STOCKS and DIES, PLUG and
TAPER TAPS, HAND, NUT and SCREW
TAPS, PIPE TAPS and REAMERS.

Price-List on Application.

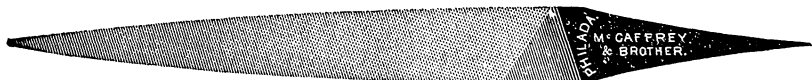
Established by DANIEL B. KING, 1829.

Philadelphia, 1876.

For Superiority.



McCaffrey File Co.,
FIFTH and BERKS STS.,
PHILADELPHIA, PA.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.
Superiority acknowledged wherever used, sold or exhibited.

BEST		"TROJAN" HORSE RASPS.		LOWEST	
CRUCIBLE				IN	
STEEL.				PRICE	
STRONGEST		BANKER & WHITE,		LET	
TOOTH.		TROY, N. Y.		US	
		(Troy File Works.)		QUOTE	

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS**, Publisher and Bookseller, 96-102 Reade Street, New York.

THE KNAPP & COWLES MFG. CO.,
BRIDGEPORT, CONN.

Makers of a large line of



STANDARD

Hardware Specialties.

SEND FOR

K Catalogue.

Porcelain Lined Lemon Squeezers



Best Common Mouse Traps, Steak Hammers, Boot Jacks, Lap Boards, Beacon Hill Pat. Mouse Traps, Mallets, Bung Starters, Hand Screws.
Ripley Mfg. Co., Unionville, Conn.

HOWARD IRON WORKS,
BUFFALO, N. Y.

Manufacturers of

BENCH VISES.

Price Lists sent on application.

TRADE MARK

John Wilson's Butchers' Knives and Steels,

Skinning, Sticking, Farriers' & Shoe Knives,

Have established and maintained their reputation, for superiority,
against all Competitors, from

THE YEAR SEVENTEEN HUNDRED & FIFTY,

and are still in increasing demand. As in the past, it is the unalterable
DETERMINATION OF THE HOUSE TO SEND OUT NOTHING BUT WHAT IS OF THE HIGHEST POSSIBLE QUALITY.

WORKS: SYCAMORE STREET, SHEFFIELD, ENGLAND.

SOLE AGENTS FOR THE UNITED STATES, AND THE CANADAS.
Messrs. Hermann Boker & Co., 101 and 103 Duane St., New York.

CORPORATE MARK

JOSEPH RODGERS & SONS, Limited.

—MANUFACTURERS OF—

Pocket and Table Cutlery, Scissors, Razors, Erasers, &c., &c.

These goods have fully maintained their reputation as the best cutlery in the world for over

ONE HUNDRED AND FIFTY YEARS.

Any Infringements of our Name and Corporate Mark will be promptly prosecuted.
Sole Agents for the United States,

ALFRED FIELD & CO., 93 Chambers and 75 Reade Street, New York.

Established 1836.

ALFRED FIELD & CO.

93 Chambers and 75 Reade Streets,
NEW YORK.

IMPORTERS OF

HARDWARE CUTLERY. GUNS ANVILS
CHAINS. FILES.

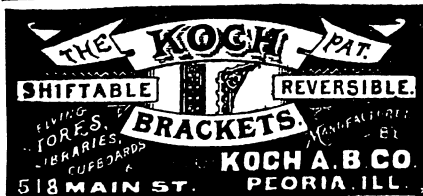
SOLE AGENTS FOR

Joseph Rodgers & Sons, Best Cutlery in the world; W. K. & C. Peace, unrivaled Grass Hooks, Straw Knives and Scythes; Joseph Elliot & Sons, Celebrated Razors; Peugeot Frères, "French Toilet" and other Clippers; L. Hugoniot Tissot, Fine Steel Pliers, &c.; Eley Bros., Caps, Wads, Cartridge Cases, &c.; Webster & Horsfall, Steel Wire of every description.

Send for Rodgers' New Illustrated Catalogue

MANUFACTURERS of Ship Carpenters', Tinner's, Coopers' and Butchers' Tools. Our specialties are Meat Cutting Machine Knives, Planing Mill Knives, Leather Splitting and Paper Cutting Machine Knives, Butchers' Cleavers, Bark Spuds, &c., &c. We solicit a share of your valued orders.

BUFFALO EDGE TOOL WORKS,
RIDGWAY, PA.



THE UNIVERSAL BRACE.

Patented August 23, 1892.

Adapted to **general** use; also to the **special** use of boring and screw-driving in Angles, Corners, close to Washboards and Walls, and in all places difficult or impossible to reach with the ordinary Brace.

6, 7 and 8 inch SWEEPS.

Unequaled as a Corner Brace.

The crank arm revolves at right angles to the bit.

The frame is readily and firmly held in any desired position with one hand.

The thrust of the tool is directly in the line of the bit.

The operation is familiar, natural and convenient. All parts are simple and durable.

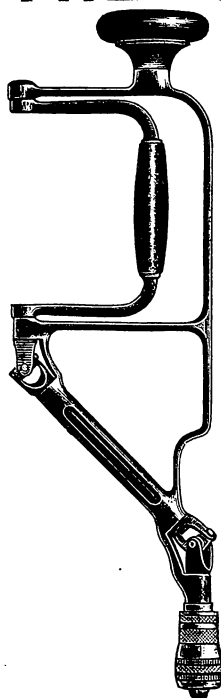
In case of damage, any part can be duplicated.

AGENCIES IN ALL THE PRINCIPAL CITIES.

The National Manufacturing Co.,

WILKES-BARRE, PA.

New York Office and Warehouse, 87 Liberty St.



J. R. TORREY & CO., Worcester, Mass.

New York Office: 74 Reade Street.



No. 8 X.

The **TORREY RAZOR STROPS** are known the world over as the standard for excellence in setting a fine edge. We manufacture and carry in stock more than 150 styles.

—Send for Illustrated Catalogue.—

"Stamped with the BUCK'S HEAD."

BUCK BROTHERS EXTRA.

TRADE MARK

BUCK BROTHERS,
MILLBURY, MASS.

The Most Complete Assortment in the U. S. of
Shank, Socket Firmer and Socket Framing
Chisels.

PLANE IRONS.

Buyers are cautioned against any parties who claim a recent connection (or any connection for over 20 years) with Buck Bros., or who represent goods as our make not stamped with the **BUCK'S HEAD** or **BUCK BROTHERS** in full.

ESTABLISHED, 1825.

INCORPORATED, 1892.

R. HEINISCH'S SONS CO., NEWARK, N. J.

New York Office, No. 90 Chambers Street.

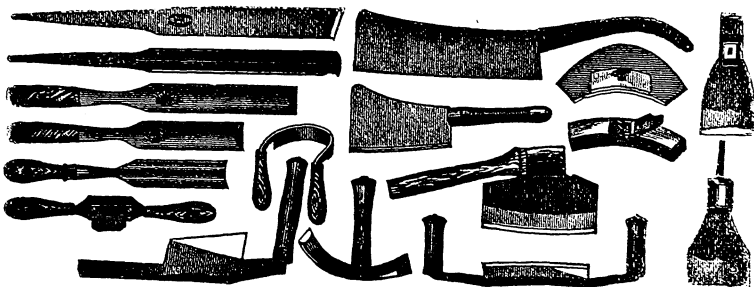


Tailors' Shears, Trimmers, Scissors,
Tinnerns' Snips, &c

CATALOGUES AND PRICES ON APPLICATION.

We have no contract with Messrs. Hermann Boker & Co. as Agents for the sale of our goods.

HIGHEST AWARD PARIS EXPOSITION, 1889.



ESTABLISHED 1837.
INCORPORATED 1892.

THE L. & I. J. WHITE CO.,
BUFFALO, N. Y.

MANUFACTURERS
OF**EDGE TOOLS.**

Coopers', Carpenters' and Ship Tools, Plane Irons,
Cleavers, &c. Full Line Chisels.

Lightning Band for Cases and Crates.

(COVERED BY U. S. LETTERS PATENT.)

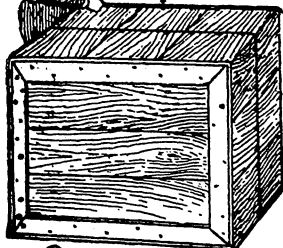


Mounted on reels and always ready for use and convenient to handle. Easily and quickly binds shipping cases and crates in a neat, strong and substantial manner.

PRICES:

No. 1, per reel of 2000 ft., \$4.50 net.
No. 2, per reel of 2000 ft., \$4.75 net.
Pliers for cutting wire, 50 cents extra.
No. 1 for cases under 300 or 400 pounds, and No. 2 for all heavier cases.

Buffalo Specialty Mfg. Co.
Sole Manufacturers,
Buffalo, N. Y., U. S. A.

**Cast Shears.**

ACME SHEAR CO.,

BRIDGEPORT, - CONN.

MARTEN DOSCHER,
Commission Hardware,

88 Chambers St., New York.

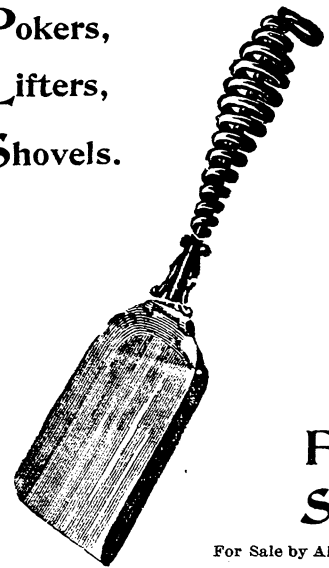
Agent—G. W. Bradley's Edge Tools, Axes, Coopers' Tools. Cleavers, Bush Hooks, Draw Knives, Ship-Carpenters' Tools, &c. Also a full stock of Planes, Brooks' Bright Wire Goods, Washita Stone, and Taunton Tack Co.'s Rivets, &c.

ALASKA.

ALWAYS COLD.

Stove Trimmings.

Pokers,
Lifters,
Shovels.



Fire
Sets.

For Sale by All

First-class Jobbers in Hardware.

Made under Gaitly Patents and only by

Troy Nickel Works,
TROY, N. Y.

FRANCIS FROST & CO., Toronto, Ont.
Canadian Sales Agents.

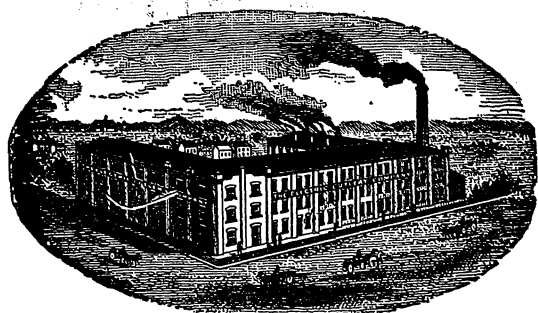
WHEN IN WANT OF**WOSTENHOLM'S****I★XL****Knives or Razors,**

SEND TO

FRED. B. GURNEY.

116 Chambers St., N. Y.

The Best Equipped Cutlery Works in the World.



FACTORY, FOURTH & DICKERSON STS., NEWARK, N. J.

THE ELECTRIC CUTLERY CO.,

113 Chambers St., N. Y., and Newark, N. J.

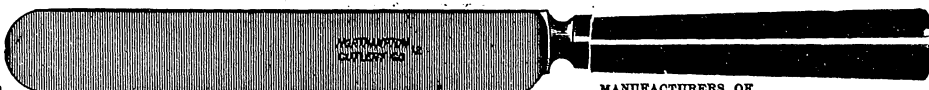
Manufacturers of Razors, Knives,
Razor Strops, Scissors and Shears

(SEND FOR CATALOGUES.)

NORTHAMPTON CUTLERY COMPANY, NORTHAMPTON, MASS.

NEW YORK

SALESROOM,



MANUFACTURERS OF

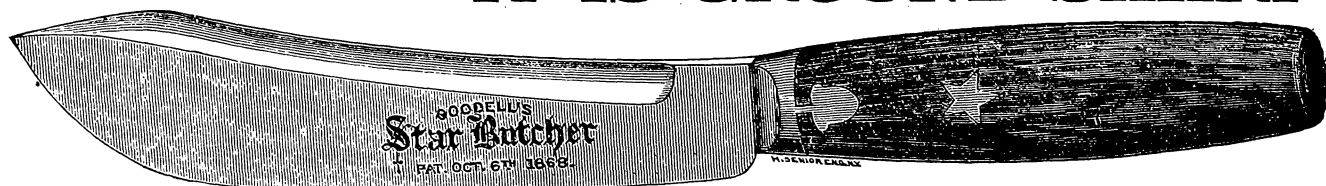
122 Chambers

Street.

TABLE CUTLERY, BUTCHERS' CARVERS, PLATED GOODS, &c.

Send for Revised Catalogue.

**THERE IS NOTHING NEW
TO SAY ABOUT THIS KNIFE EXCEPT
IT IS GROUND SHARP**



WE DON'T KNOW HOW TO IMPROVE IT.

Blade is made of steel especially prepared for the purpose, and it is made just right; finish excellent; shape unsurpassed; the handle just fits the hand.

GENERAL APPEARANCE IRREPROACHABLE.

Made in sizes from 5 inch to 8 inch; a strictly first-class butcher knife at a moderate price.

WE HAVE OTHER BUTCHER KNIVES,

4½ to 14 inch blade, that will cut as well, for less money. Also Table Knives and Forks, Carvers, Butcher Steels, Bread Knives, Cheese Knives, Butter Spades, Apple, Kitchen, Putty, Cigar, Shoe Knives, &c., &c., in great variety. We aim to make the best and sell at reasonable prices.

GOODSELL COMPANY, ANTRIM, N. H.

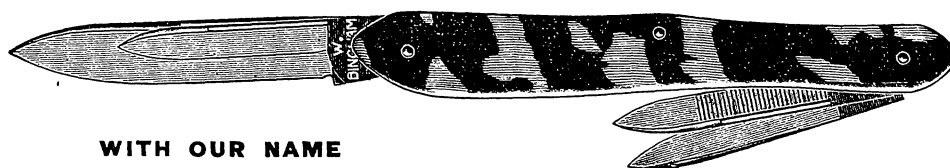
AGENTS:

THE ALFORD & BERKELE CO., 77 Chambers St., N. Y. City.

HENRY KEIDEL & CO., Baltimore, Md.

A

Knife,
Razor,
Scissor,
Shear,



WITH OUR NAME

That money
and 50 years'
experience can
buy.

IS THE BEST
THE W. BINGHAM CO., Cleveland, O.

FAYETTE R. PLUMB,

Edge Tools

Hammers

AND

Sledges.

Manufacturer of



Main Office and Works

Railroad,
Miners'

AND

B. S. Tools.

Penna. R. R., Tucker and James Sts.

Philadelphia, Pa., U. S. A.



**The Bridgeport
Chain Co.'s Triumph**
Chain, made into Halters
Traces, Cow Ties, Tie-

outs, Kennel Chains, &c.; also cut to lengths for manufacturers' use.

The cut represents the exact size of 6/0.

Thirteen Sizes made, 6/0 being the Largest.

FACTORY AT
BRIDGEPORT, CONN.



We have a full line of above, which is the neatest pattern ever presented to the trade, and it is stamped

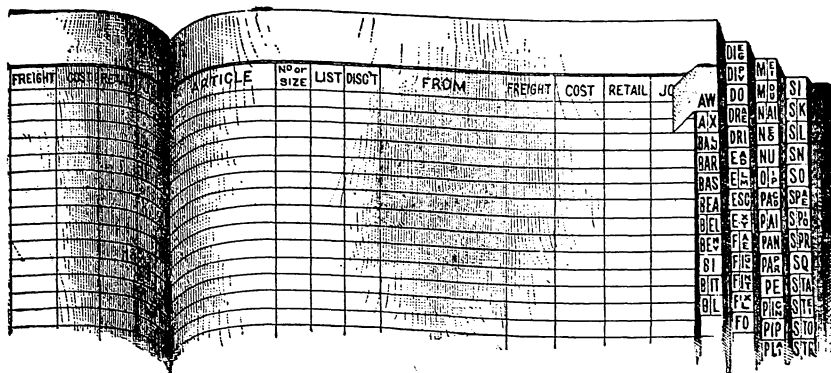


NONE GENUINE WITHOUT THIS TRADE-MARK.

WM. ROGERS MFC. CO., Offices, Hartford, Conn.
 FACTORIES, HARTFORD, CONN., NORWICH, CONN., AND TAUNTON, MASS.

The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



AD	DI _E	ME	SI
AN	DI _V	MO	SK
AU	DO	NAI	SL
AW	DR _E	NE	SN
AX	DRI	NU	SO
BA _N	E _D	OP	SP _E
BAR	EM	PA _D	SP _O
BAS	ESC	PAI	SPR

Fac-Simile of Indexing.

SIZE.—The book is 8¼ x 11 inches (much larger than Price Books A, B, C, D or E), 556 pages.

PAPER.—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

BINDING.—The binding is of the very best quality—flexible seal grained leather.

INDEX.—By means of the arrangement shown in the cut the four rows of index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line, and gives ample space for recording prices.

Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

SUPPLEMENT.—An 80-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$7.50.

Advantages of Multiple Index Price Book.

A SPECIAL feature of the books is the arrangement of the index characters, which, instead of being alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the first two or three letters of the names of Hardware articles as shown above. The ease and convenience with which the books can be used is indicated in the following examples, taken from Book F:

For Augers,	turn to	AU	For Chisels,	turn to	CH _U	For Iron,	turn to	IRO
" Parers, Apple	"	PA _P	" Cutlery,	"	CUT	" Irons,	"	IR'S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SH _O
" Pumps,	"	PUM _N	" Rules,	"	RU _L	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

Hardware Classification.—A pamphlet containing a classification of the leading Hardware articles is furnished with the price books.

Standard Lists.—In connection with these price books a set of *The Iron Age* STANDARD HARDWARE LISTS can be used with great advantage. Price 25 cents.

These price books, which have been prepared by R. R. Williams, Hardware Editor of *The Iron Age*, are presented to the attention of Hardware men in the confidence that they will be found a most valuable aid in keeping track of prices.

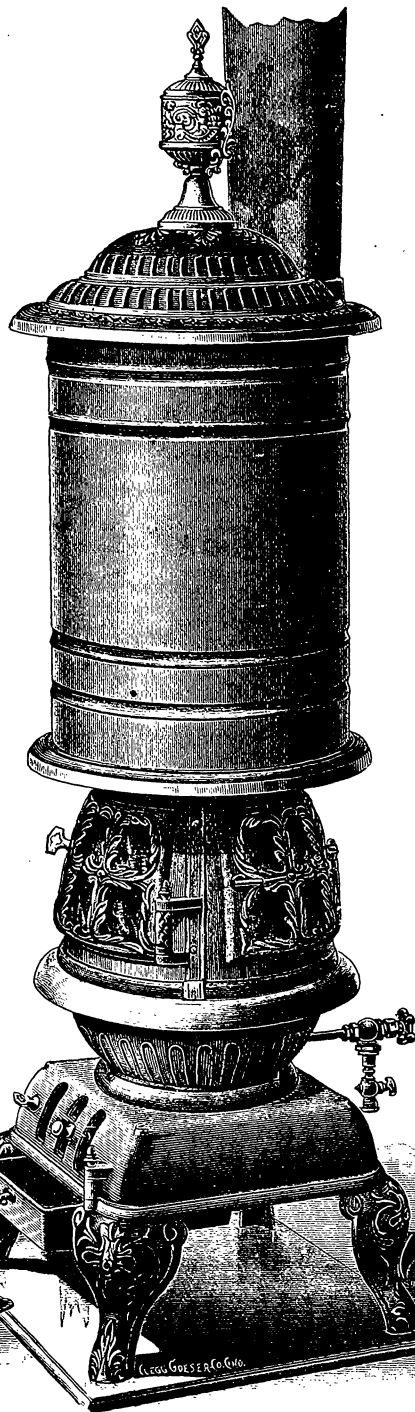
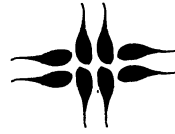
Sent, Post-paid, on Receipt of Price, by

DAVID WILLIAMS, Publisher, - 96-102 Reade St., New York.

Petroleum

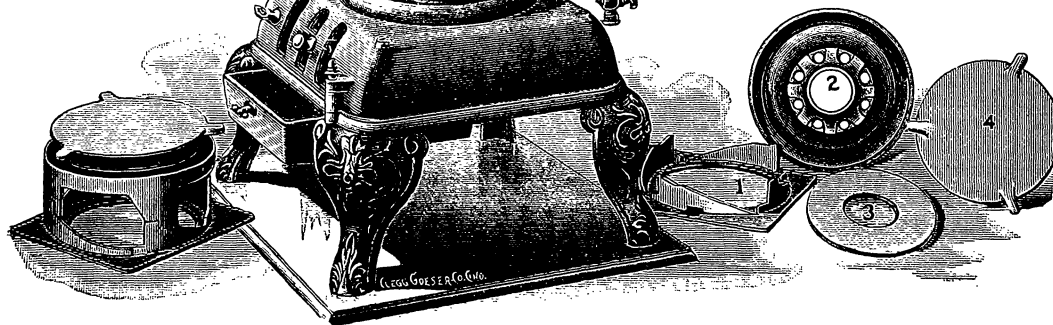
Oil Stove.

AN INTENSE HEAT,
A STEADY HEAT
AT ALL TIMES.



FOR BURNING Crude Petroleum, Torch or Kerosene Oil. Has a stove pipe which carries off the waste products of combustion, so there is no odor, no smoke and no foul air.

Can be changed from an oil stove to one for burning coal by lifting out the top plate of burner and substituting a coal grate which is furnished with each stove. This can be done in a moment and while the stove is red hot, and without allowing the fire to go out. Experiments extending over several months' time show the stove consumes from one-sixth to one-fourth gallon of Crude Oil per hour, according to the amount of heat required. The oil can be bought for from three to four cents per gallon.



FOR full particulars and prices, address - - -

THE FOSTER STOVE CO., IRONTON, OHIO,

.. .. Manufacturers of Cook and Heating Stoves.

IMPROVED EDITION OF THE IRON AGE HARDWARE PRICE BOOKS.

Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

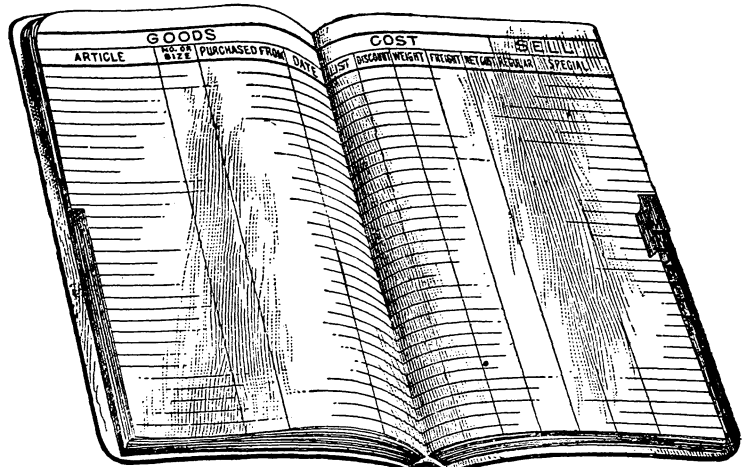
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

A, 200 pages,	-	-	-	-	\$1.00
A F, 200 pages with flap,	-	-	-	-	1.25
A 2, 400 pages,	-	-	-	-	1.50
A F 2, 400 pages with flap,	-	-	-	-	1.75



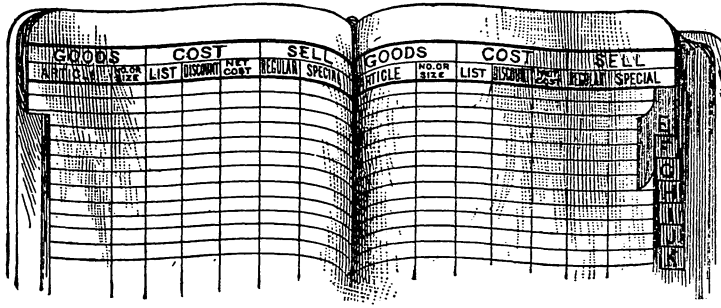
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

B, 200 pages	-	-	-	-	\$1.00
B F, 200 pages with flap,	-	-	-	-	1.25
B 2, 400 pages,	-	-	-	-	1.50
B F 2, 400 pages with flap,	-	-	-	-	1.75



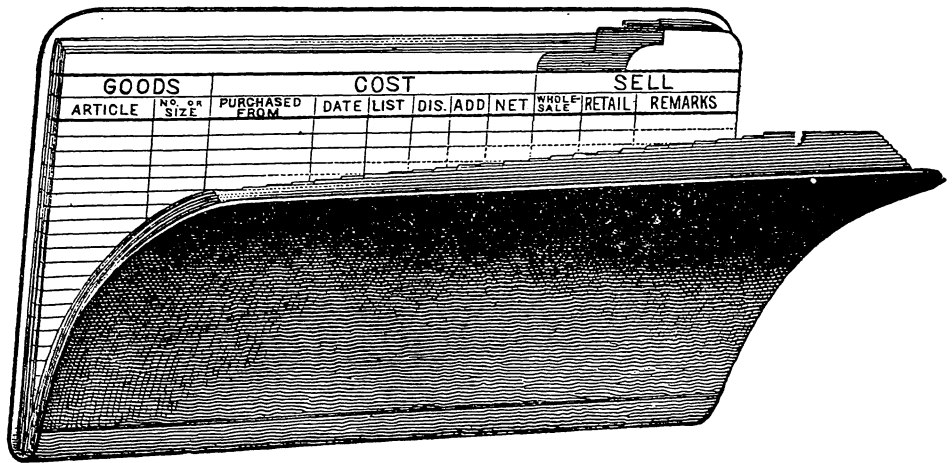
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

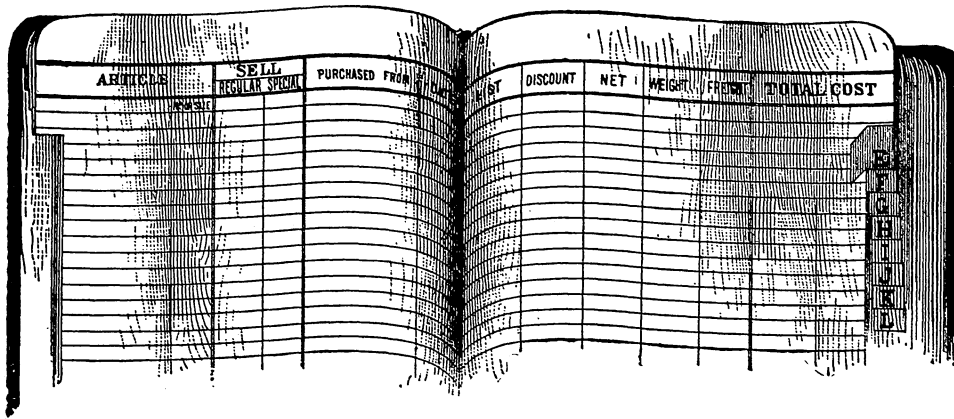
Size, 4 1/4 x 7 1/4 in.; grain seal leather.

FOUR EDITIONS.

C, 200 pages,	-	-	\$1.00
C F, 200 pages with flap,	-	-	1.25
C 2, 400 pages,	-	-	1.50
C F 2, 400 pages with flap,	-	-	1.75



Hardware Price Book C.



Hardware Price Book D.

Arrangement is adapted to the requirements of the trade in this direction.

FOUR EDITIONS.	D, 200 pages,	-	-	-	\$2.00
	D F, 200 pages, with flap,	-	-	-	2.50

Size 5 1/4 x 8 in.; grain seal leather.

	D 2, 400 pages,	-	-	-	\$3.00
	D F 2, 400 pages, with flap,	-	-	-	3.50

Price Book D will recommend itself particularly for desk and store use, and for salesmen on the road.

The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This arrangement is adapted to the requirements of the trade in this direction.

Sent, post-paid, on receipt of price by **DAVID WILLIAMS, Publisher, 96-102 Reade St., New York.**

DAME, STODDARD & KENDALL,

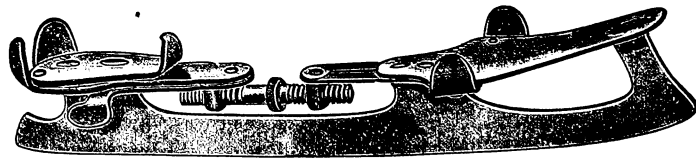
IMPORTERS AND WHOLESALERS,

374 Washington St., Boston, Mass.

Headquarters for Winslow Skates.

Obtain our Prices before Ordering Elsewhere.
1893-94 Catalogue Now Ready.

The SAMUEL WINSLOW SKATE MFG. CO., Worcester, Mass. U.S.A.



The most extensive Skate Factory in the World.

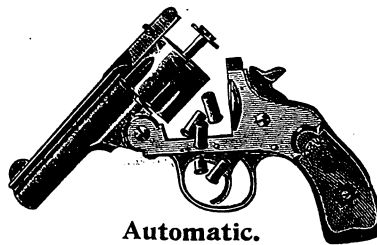


Send for Illustrated
CATALOGUE free.

FOREHAND ARMS CO'S.

LINE OF QUICK SELLING

REVOLVERS.



Automatic.

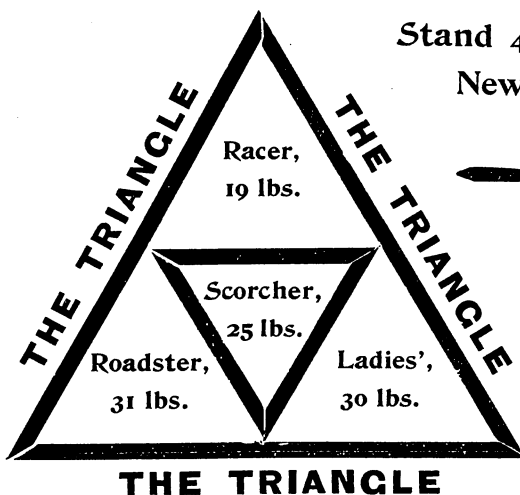


Hammerless.

Forehand Arms Co.,

—ALSO—

MANUFACTURERS OF A LARGE LINE OF GUNS
FOR THE HARDWARE TRADE,
WORCESTER, MASS.



Stand 49,
New York Show.

Bicycles

Come and See Us.

'94

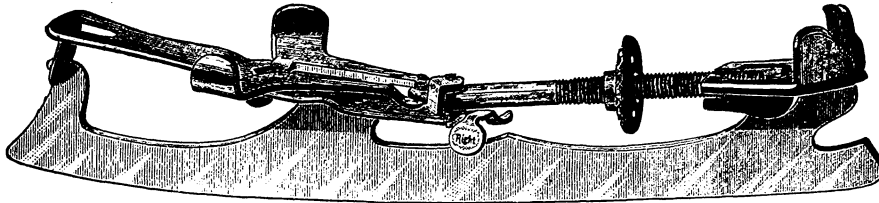
Fine Line of Wheels.

THE PEERLESS MANUFACTURING CO.,

CLEVELAND, OHIO.

THE LONG REACH SKATE

has stood a practical test for eight years and is absolutely without a rival in the market.

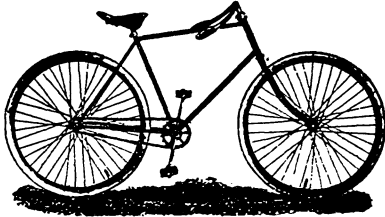


FOR CATALOGUES AND PRICES, ADDRESS

THE JOHN P. LOVELL ARMS CO., Boston, Mass., U. S. A.

WESTERN WHEEL WORKS.

BICYCLE



MANF'TRS

From \$20

to \$135.

MOST COMPLETE LINE MADE.

OFFICE AND FACTORY:

Wells, Schiller and Sigel Sts., and N. Park Ave., Chicago, Ill., U.S.A.

SICKELS, SWEET & LYON,

Wholesale Hardware.

Office, 35 Barclay St. Warehouse, 40 Park Place, New York.

N. Y. AGENTS FOR

WINSLOW SKATES.

Eagle Files.

Union Steel Screw Co.'s Screws.

Orders for Skates should be placed early. Shipments from factory or New York as preferred.

Fall Catalogue No. 6 Issued September 1st.

SICKELS, PRESTON & NUTTING CO.,

Wholesale Hardware and Tinnery's Stock.

N. Y. Office as above.

DAVENPORT, IOWA.

YOUR SKATES WILL NOT RUST

IF YOU USE

PARAVASELINE.

It is a Lubricant that will prevent all kinds of metals from rusting. **WHEN YOU COME HOME AFTER SKATING** apply a light coat of Paravaseline to your skates and it will keep them in good condition. **ONE TUBE WILL LAST A YEAR** and will be mailed to any address on receipt of 25 cents or you can get them at all hardware or skate stores. MANUFACTURED BY THE BRIDGEPORT GUN IMPLEMENT COMPANY, 313 & 315 Broadway, New York.

THE WILLIAMS PRINTING CO.,

Commercial Printers AND Binders.

ESTIMATES FURNISHED FOR ALL CLASSES OF WORK.

96, 98, 100 and 102 READE STREET,

NEW YORK.

DO YOU AIM



To Make a Bull's Eye

In Your Business or at the Range?

If you deal in ARMS or AMMUNITION or shoot a Rifle, Pistol or Shot Gun, you will make a HIT by sending for the IDEAL HAND BOOK.

IDEAL MFG. CO., New Haven, Ct., U. S. A.

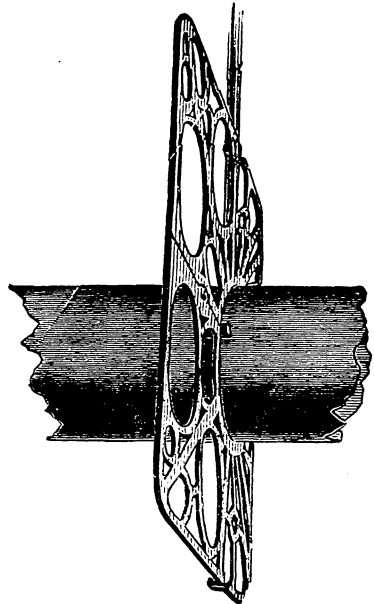
Please mention The Iron Age when you write.

The Henry C. Hart Mfg. Co.

DETROIT, MICH.,

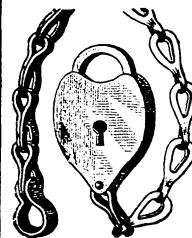
MANUFACTURERS OF

HARDWARE SPECIALTIES.



STANDARD STOVE PIPE SHELF.

SEND FOR CATALOGUE.



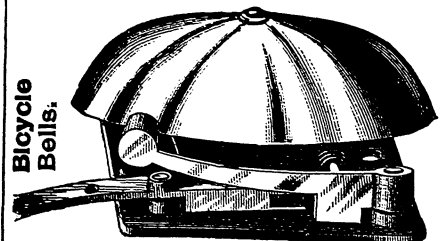
Bicycle Locks.

Bicycle Bells.

Especially Low Prices.

We manufacture hardware specialties of all descriptions to order.

HAINES & ZIMMERMANN, 407 Cherry St., Phila.



Bicycle Bells.

BEVIN BROS. MFG. CO., Easthampton, Conn. Manufacturers of

Sleigh Bells, House, Tea Hand. Gong Bells, &c.

— REMEMBER —

WE MAKE ONLY

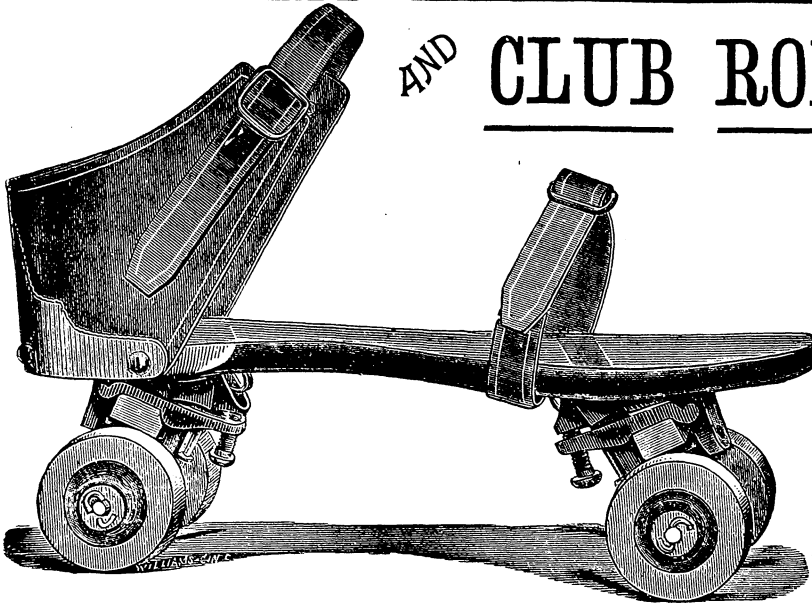
The Very Highest Grade

OF

MECHANICS' TOOLS.

H. H. MAYHEW CO., Shelburne Falls, Mass

HENLEY'S CELEBRATED RINK AND CLUB ROLLER SKATES.

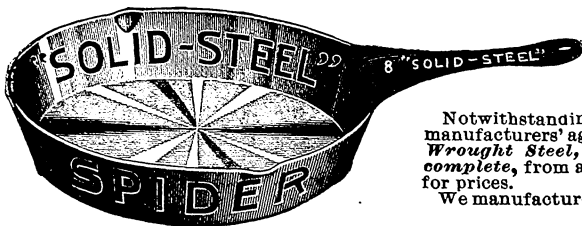


A full, new and complete stock of Roller Skates, Skate Repairs and Rink Supplies. Address for 80 page catalogue and prices,

M. C. Henley,

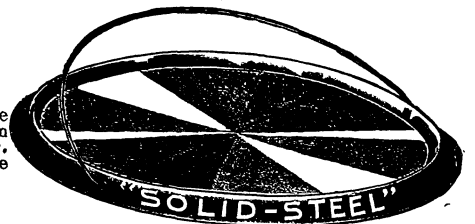
RICHMOND, IND.

"SOLID-STEEL" SEAMLESS HOLLOW WARE.



BRILLIANT FINISH.

Notwithstanding the claims made by some manufacturers' agents, our spiders are made from *Wrought Steel, Without Seams or Rivets.* complete, from a single piece of metal. Write for prices. We manufacture our own goods.

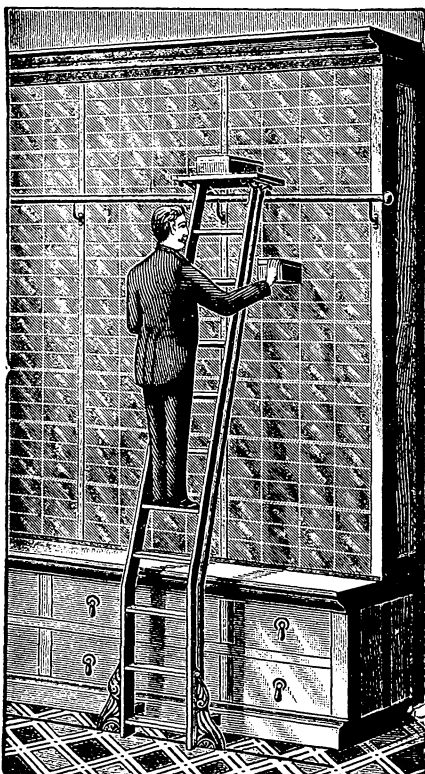


No Seams, no Rivets in "Solid-Steel" Ware.

Made either with Balls or Solid Handles.

The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.



FLOOR TRACK BICYCLE LADDER

No other Ladder Service can approach the "Bicycle" in ease and convenience of operation. Compared with others they work like a bicycle beside a lumber wagon.

Can be applied to any kind of shelving made. See this space next week for other styles. Send for Illustrated Catalogue and prices to

THE BICYCLE STEP LADDER CO.,
50 State street, Chicago, Ill.

IF YOU WANT THE BEST
BRITANNIA SPOONS
SEND TO
FOR CATALOGUE & PRICES
THEIR MAKE IS EQUAL TO ANY OTHER
IF NOT SUPERIOR
TO ANY OTHER
HADDAM, CONN.
HAVE BEEN IN BUSINESS SINCE 1840.

IF YOU WANT THE BEST
NICKEL SILVER SPOONS
SEND TO
FOR CATALOGUE & PRICES
THEIR MAKE IS EQUAL TO ANY OTHER
IF NOT SUPERIOR
TO ANY OTHER
HADDAM, CONN.
HAVE BEEN IN BUSINESS SINCE 1840.

IF YOU WANT THE BEST
SILVER PLATED SPOONS
SEND TO
FOR CATALOGUE & PRICES
THEIR MAKE IS EQUAL TO ANY OTHER
IF NOT SUPERIOR
TO ANY OTHER
HADDAM, CONN.
HAVE BEEN IN BUSINESS SINCE 1840.

WM. KROGSrud,
Engraver and Die Sinker,
61 Fulton St., N. Y.
Manufacturer of
STEEL STAMPS
For Every Purpose.
Steel Letters and Figures.
Burning Brands, Stencils,
&c. Send for Illustrated
Catalogue.

3 NICKLE, Silver and Bronze Metallic
Figures and Letters, Sizes 1/4 in to 3 in.
Pattern Letters, Steel Stamps, Brands
Dies &c. Send for Reduced Price List.
We make a specialty of the Hardware Trade.
A. A. WHITE & CO., Providence, R.I.

CHAS. W. HOEFIG,
ENGRAVER AND DIE SINKER,
52 FULTON ST., - N. Y.
STEEL STAMPS,
BRASS DIES, BURNING BRANDS, &c.
Designs on Steel Finely Executed.

THE QUEEN ANNE SCREEN CO.,
Burlington, Vt.,
MANUFACTURERS OF
Improved Adjustable Window Screens.
THE QUEEN ANNE. With box panels; the only
screen made and finished alike on both sides.
THE EUREKA. The best cheap extension screen
on the market.
SCREEN DOORS. Finished all ready to hang
Sticks, Corners, Improved Frames, &c.
Write for circular and Price-list.



HOW TO KEEP A STORE

BY S. H. TERRY.

406 PAGES, 5 x 7 1/4 INCHES.
POST-PAID, \$1.50.

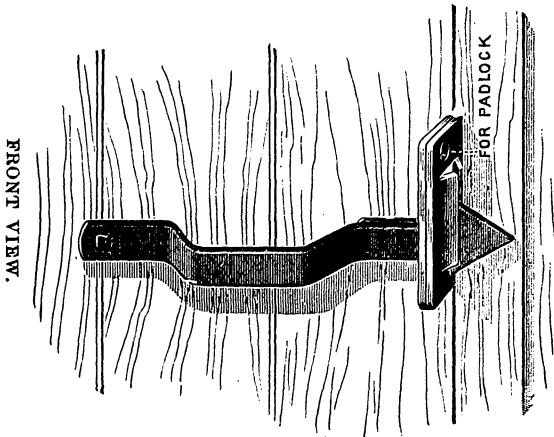
Among the subjects discussed are: The selection of a business; choice of a locality; buying a stock of goods examining, marking and arranging goods how to advertise; employment of clerks seeing for cash and credit; keeping accounts; expenses; copartnerships; losses by fire, theft, &c.; influences of social life on business; buying at auction; investment of profits; insolvency; business qualifications

FOR SALE BY

DAVID WILLIAMS, Publisher and Bookseller
96-102 Reade St., New York

LANE'S SLIDING DOOR LATCH.

—◇MADE OF STEEL.◇—



FRONT VIEW.

IT IS DESIGNED especially for sliding doors. It is strong, durable and practically unbreakable. It is adapted for either right or left edge of door. It may be applied to either the inside or outside of door. It is also adapted for use on double door. It has no exposed screws or bolts that can be tampered with from the outside.

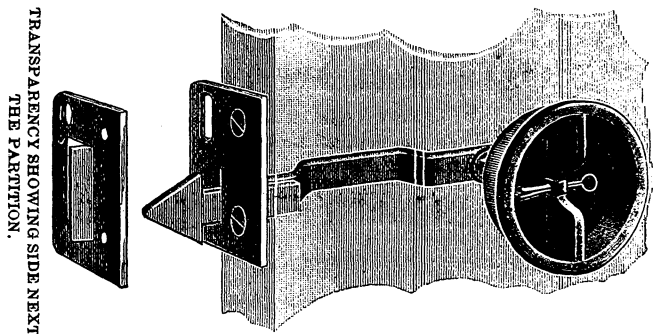
1 DOZEN IN BOX.

LIST, \$4.00 PER DOZEN.

GENERAL AGENTS:

John H. Graham & Co,

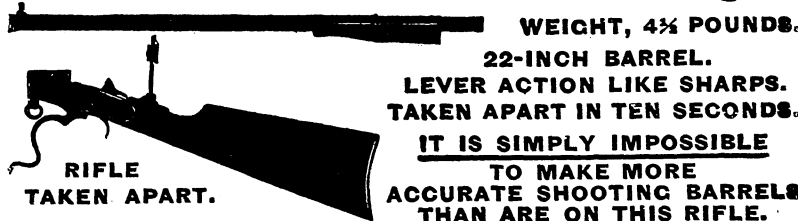
113 Chambers St., New York.



A Triumph in Small Bore Rifles. STEVENS' "FAVORITE" RIFLE.



Made for the 22 or 25 Rim Fire Cartridge.



- No. 17. Plain Open Sights.....\$12.50
- No. 18. Vernier, Open Back, and Beach Front Sights..... 17.00
- No. 19. Lyman Peep, Open Back, and Lyman Front Sights, 17.00

A 60 Page Catalog showing our full line of Fire Arms with TRADE PRICE LIST sent with pleasure to all dealers.

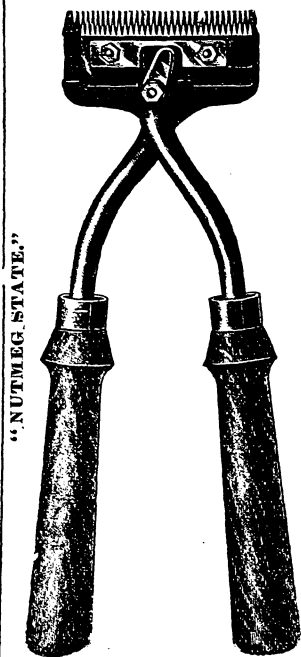
J. Stevens Arms & Tool Co.,

P. O. Box 5729.

Chicopee Falls, Mass. U. S. A

Edward S. Hotchkiss,

MANUFACTURER OF HARDWARE,
BRIDGEPORT, CONN.



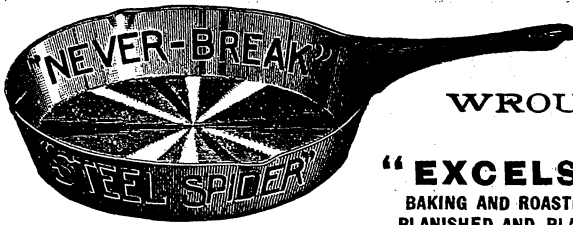
SATISFACTORY PRICES. Standard goods. Don't fail to write when in want of Horse and Barber's Clippers, No. 20 Steel Rat Killers, Curry Combs, Metal and Wood Choker Mouse Traps, Lemon Squeezers, Baxter Pattern Wrenches, &c., &c.

AMERICAN TOOL COMPANY,
NEW YORK,
MANUFACTURERS OF

TOOL CHESTS

Of all sizes, complete with tools, for Hardware, Toy Notion and Variety trades.
Factory and Salesroom,

200 West Houston Street, near Varick.
Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.

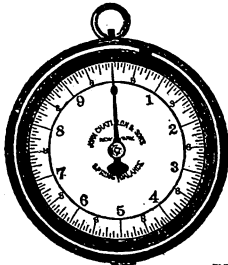


"MIRROR POLISH," the only Perfect Plain Steel Finish.

"NEVER-BREAK"
WROUGHT STEEL COOKING UTENSILS.
MIRROR POLISHED-TINNED-PORCELAINED.
"EXCELSIOR" BAKING AND ROASTING PANS,
PLANISHED AND PLAIN STEEL.
"PURITAN" COOKERS, COFFEE POTS AND
OTHER SPECIALTIES.
"IDEAL" BRASS, BRONZE, NICKEL UM-
BRELLA STANDS, CUSPIDORS,
ETC., ETC., ETC.
THE BRONSON SUPPLY CO.,
CLEVELAND AND NEW YORK.

John Chatillon & Sons,

85, 87, 89, 91, 93 CLIFF ST., NEW YORK

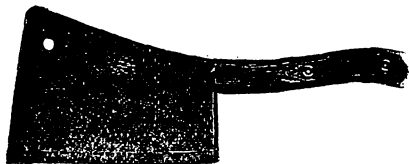


ESTABLISHED
1885.

SEND FOR
PRICE LIST

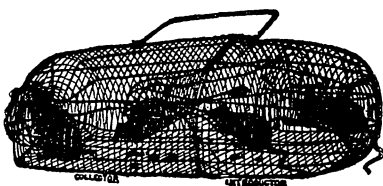


Sole Agents for
Foster Bro.'s Butchers' Cutlery.



John Chatillon & Sons, N. Y.

GENUINE **MARTY** RAT AND
ALWAYS IN STOCK. MOUSE
TRAPS



THEY DO THE WORK.
Orders solicited. Prices on application.
BURDITT & WILLIAMS,
20 Dock Square, Boston, Mass.
—SOLE AGENTS AND IMPORTERS.—



No. 3

Globe Street Lamp.

Light your Streets and Driveways.
The S. G. & L. CO.

Tubular Globe Street Lamp

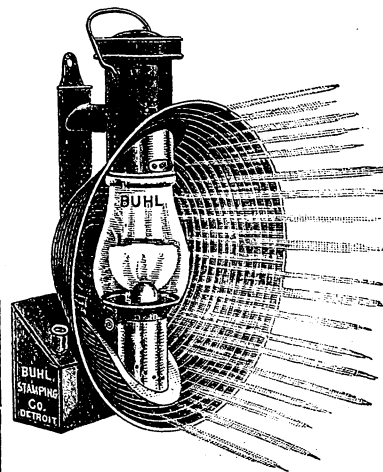
IS THE Best Street Lamp Manufactured.
Equal to the best Gas Light.
Will not Blow Out in the Strongest Wind.
Will not Smoke.
Will not Freeze.
Automatic Extinguisher.
Outside Wick Regulator.
Will Burn Four Hours for One Cent.

MANUFACTURED BY

STEAM GAUGE AND LANTERN CO.,

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.



Buhl Tubular Headlight.

IMPROVED FOR 1893-94.

The most brilliant light at least
expense for Halls, Factories,
Barns, Boat Houses, Traction En-
gines, etc.

Buhl Stamping Co.,
DETROIT, MICH.,

MANUFACTURERS OF

TUBULAR LANTERNS, STEEL MILK
CAN STOCK and BIRD CAGES.

—:OUR:—

PURE ALUMINUM COOK- ING UTENSILS

Meeting with such universal appreci-
ation, we think it to our interest to
appoint ONE responsible firm of
Hardware Merchants in EACH
town and city as our sole agents.

ILLINOIS PURE ALUMINUM CO.,
LEMONT, ILLINOIS.

Manufacturers of Sheets, Medals, Utensils.

American Stamping Co.,

Manufacturers of

All Kinds of Tinware and Sheet
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.
Factory, 103 to 119 N 3d St., Brooklyn, E. D., N. Y.

HARDWARE DEALERS

CAN RECOMMEND THE

CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for
Sash Cords, very strong and lasting (some in
daily use ten years), and gives thorough satis-
faction wherever used. The patented attach-
ments are very simple and can be applied to
any window.

MANUFACTURED ONLY BY

"THOMAS MORTON,"

65 Elizabeth Street,

Write for Prices. **NEW YORK.**

THOMAS CLARKE
HARDWARE AND GENERAL AGENT.

(FIRST-CLASS REFERENCES.)

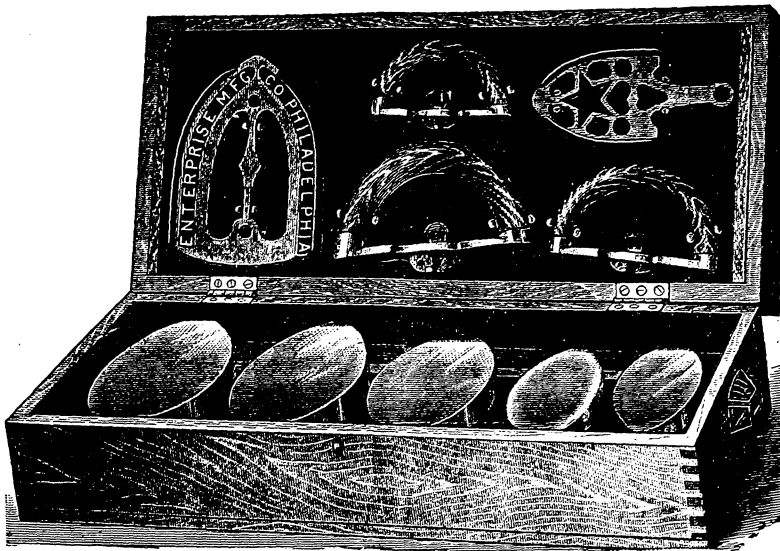
60 PRINCE WILLIAM ST., ST. JOHN,
NEW BRUNSWICK.

FAMILY OUTFIT OF SAD IRONS.

SPECIALTIES.

Meat Choppers,
Sausage Stuffers,
Mole Traps,
Mrs. Pott's Sad Irons,
Sad Iron Heaters,
Shoe Stand & Lasts,
Lawn Sprinklers,
Family Outfit of
Sad Irons,
Tincture Presses,
Tobacco Cutters,
Vegetable Slicers
Sausage Stuffing
Attachments,
Bone, Shell and
Corn Mills,
Lawn Mowers,
Fruit, Wine and
Jelly Presses.

Send for Catalogue,
FREE.



SPECIALTIES.

Coffee Mills,
Beef Shavers,
Measuring Faucets,
Cheese Knives,
Barrel Jack, Truck
and Stand,
Molasses Gates,
Bung-Hole Borers,
Cherry Stoners,
Cork Pressers,
Dried Fruit and .
Sugar Augers,
Cork Pullers,
Bullfrog Door Weight,
Flag Holders,
Ice Shredders,
Barn Door Bolts,
Meat Hooks,
&c., &c.

For Sale by the
Hardware Trade.

A USEFUL PRESENT.

THE ENTERPRISE MFG. CO. OF PA. Third and Dauphin Streets, Philadelphia
Branch Office and Warehouse with J. C. McCARTY & Co., 97 Chambers Street, New York.

FOR THANKSGIVING AND THE HOLIDAYS.

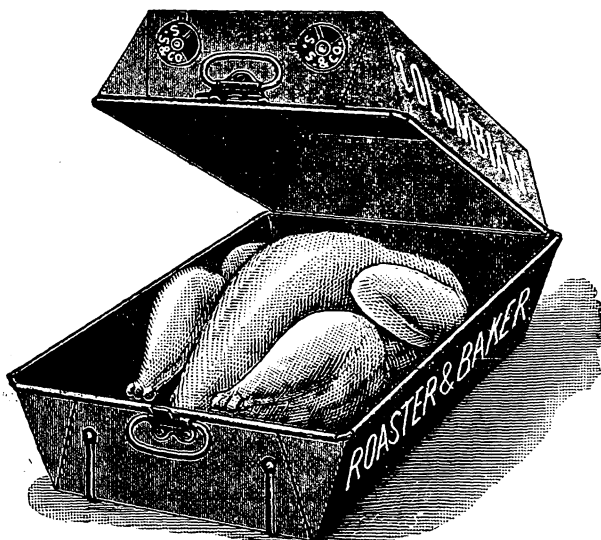
Have You a Good Stock of

COLUMBIAN ROASTERS AND BAKERS?

THEY OPEN
AT
EITHER END.

The fastenings on these pans are made of cast iron, the upper part hollowed to rest on the edge of the pan, forming a hinge. They are alike on both ends, and in combination with the handles form a simple, secure and durable lock. The wires under pan add strength and durability and allow free circulation of air underneath.

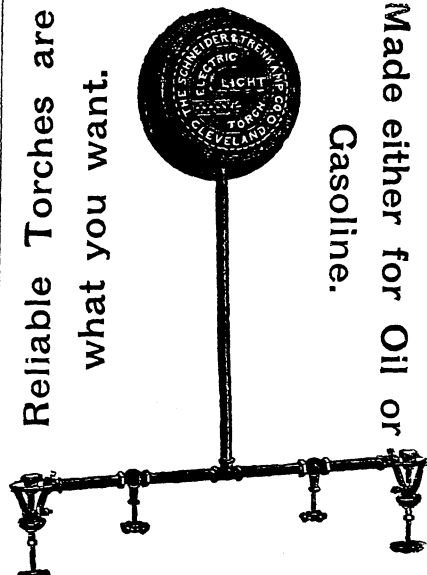
No. 5, 9 x 13 $\frac{3}{4}$ x 6 ins., \$1.50 each.
No. 10, 11 $\frac{1}{2}$ x 15 $\frac{1}{2}$ x 7 $\frac{1}{2}$ ins., \$2.00 each.
No. 20, 12 $\frac{1}{2}$ x 16 $\frac{1}{2}$ x 7 $\frac{1}{2}$ ins., \$2.25 each.
No. 30, 18 x 18 x 7 $\frac{1}{2}$ ins., \$2.50 each.
Liberal discount to the trade.



Sole Manufacturers: { **SIDNEY SHEPARD & CO., Buffalo, N.Y.**
C. SIDNEY SHEPARD & CO., Chicago, Ill.

Reliable Torches are
what you want.

Made either for Oil or
Gasoline.



These Torches are particularly adapted for use in factories, foundries, machine shops, rolling mills, blacksmith shops, warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner. Write us for prices. A liberal discount given to the trade. Manufactured by **THE SCHNEIDER & TRENKAMP CO.,** Nos. 479 to 497 Case Ave., Cleveland, Ohio.

GASOLINE & OIL
TORCHES.

TINNERS' & PLUMBERS
FURNACES.

PAINT
BURNERS.

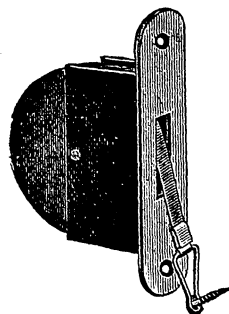
THE DANGLER STOVE & MFG. CO. CLEVELAND, O.

A Well Balanced Sash

IS LIKE

A Well Balanced Business Man,

gives satisfaction to those who are brought in contact with them. Don't be inveigled into buying anything called Sash Balances that have no record. Made from light cast iron. Ask your Hardware dealer for Pullman Steel Frame Sash Balance. Warranted 15 years. Only Steel Frame Sash Balance in the world.



SIMPLE, CHEAP
AND DURABLE.

PULLMAN SASH BALANCE CO., Rochester, N. Y.

New York Office, 142 Chambers St.

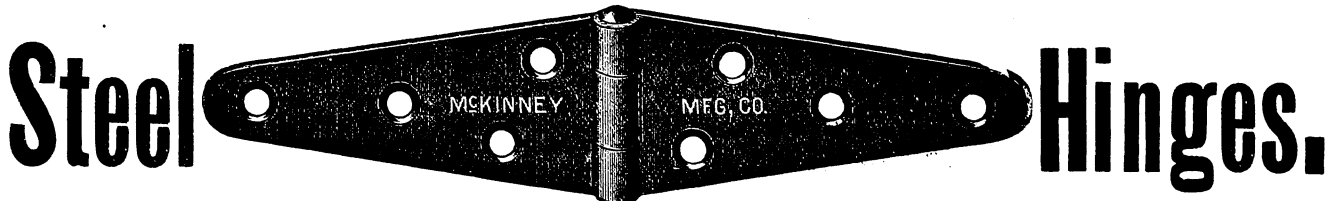
Chicago Office, 235 Lake St.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS, Publisher** and bookseller, 96-102 Reade St., New York

WE CLAIM

That one pair of our Celebrated Steel Hinges will outwear two pair of the Flimsy Invention now being forced upon the attention of the trade.

McKINNEY MFG. CO., ALLEGHENY, PA.



SEND FOR LIST.

"NONE BETTER."

BARN, MILL AND FIRE DOOR HANGERS.

HIGHEST AWARD

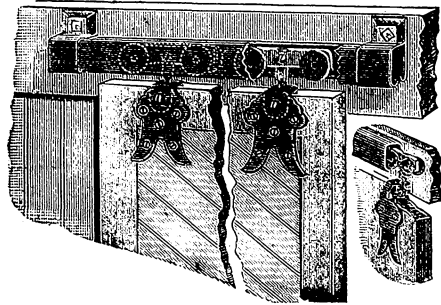
at WORLD'S FAIR, 1893,

—: ON:—

Parlor, Barn and Fire Door Hangers.

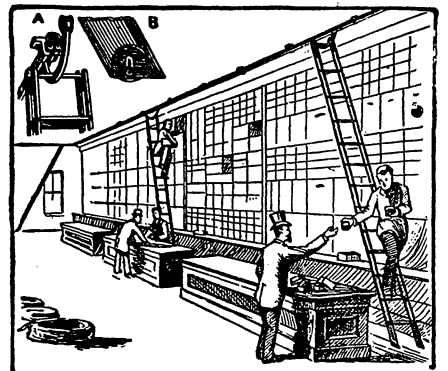
SEND FOR CATALOGUE.

COBURN TROLLEY TRAC MFG. CO.
HOLYOKE, MASS.



Barn Door with Lateral Adjustable Hanger. Very simple and cheap to apply.

We make four styles of ROLLING LADDERS to reach shelving of any height.



P. & F. CORBIN,

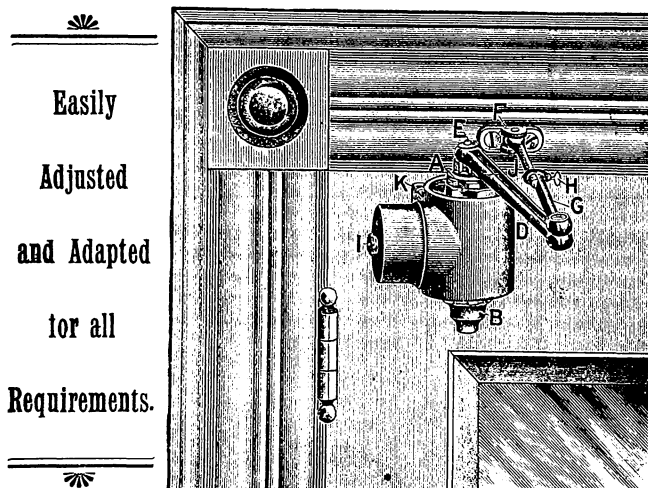
New Britain, Conn.

New York.

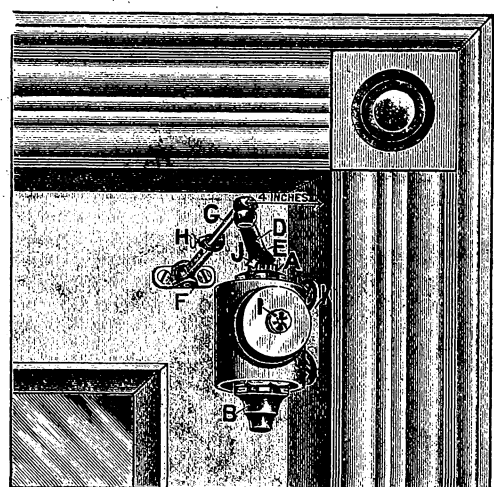
Philadelphia.

Chicago.

—) MANUFACTURERS OF (—



Easily
Adjusted
and Adapted
for all
Requirements.

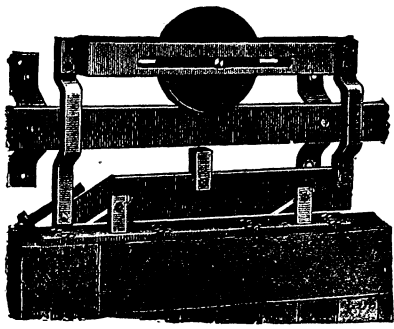


Looks Well,
Acts Well,
Wears Well.

LIQUID DOOR CHECKS AND SPRINGS,

Fine Builders' Hardware. Wood and Machine Screws.

Catalogues and Prices Furnished on Application.



LANE'S PATENT NOISELESS STEEL PARLOR DOOR HANGER.

This Hanger is made of Steel.
The Wheel is also Steel, except the filling or tread.
The Track is of Steel—a single one only.
The Hanger is Anti-Friction.
More nearly Noiseless than any other.
Ease of adjustment.

Can be erected with half the labor others require.
Track will not swell, shrink or warp out of true.
No cutting of doors.
No matching of hardware.
Simplicity in all its parts.
Durability.

ALSO LANE BARN DOOR HANGER AND TRACK. SEND FOR CIRCULARS.

Manufactured by

LANE BROS., Poughkeepsie, N. Y.
JOHN H. GRAHAM & CO., General Agents, 113 Chambers St., New York.

He had in his possession 55 skeleton keys
which the police claim would open any door.
—Chicago Tribune.

You are selling that kind of a lock every day and

your customers think you are selling the best the market affords.

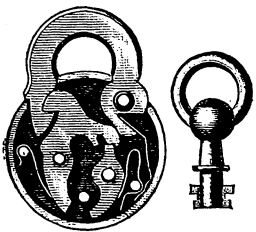
ARE YOU SELLING the best the market affords?

The Craig Locks are guaranteed Sneak Thief Proof.

Send for Catalogue.

KEYLESS LOCK CO., I. A. 197 So. Canal St., Chicago, Ill.

PATENT PERFECTION PADLOCK.



Eight Tumblers, Key Turning Both Ways.

Sizes, $\frac{1}{4}$ inch to $2\frac{1}{2}$ inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also, $\frac{1}{2}$ and $\frac{3}{4}$ inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.

Adopted by the United States Treasury for bonded warehouses.

AMES SWORD CO., Chicopee, Mass.

Send for Price-Lists and Circulars.



SALES OF THE

"Champion" 6-Lever Padlock

Never before Equalled what they attained in 1892.

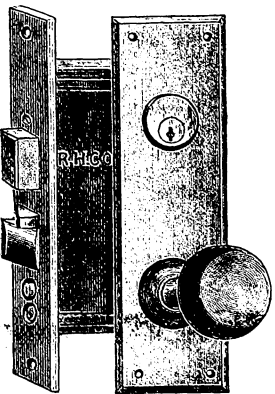
PRICE TALKS. QUALITY TALKS.

Sold by best Jobbers everywhere.

Every Dealer should have on File our Catalogue No. 11.

MILLER LOCK CO.,

4515 Tacony St., - PHILADELPHIA, PA.



READING

Hardware Company,

BUILDERS' HARDWARE

AND

FINE DOOR LOCKS.

FACTORIES, READING, PA.

Warehouses:

NEW YORK.

PHILADELPHIA.

CHICAGO

CLOTHES WRINGERS.
COLBY WRINCER CO.,

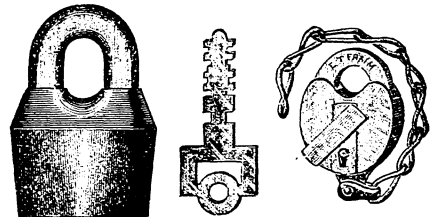
MONTPELIER, VT.

HAVE YOU Our Price-List?

ESTABLISHED 1879.

KEYSTONE LOCK WORKS,

E. T. FRAM, Lancaster, Pa., U. S. A.



Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

SURPLESS, DUNN & ALDER, General Agents,
97 Chambers St., NEW YORK.

SIMPLEST IN CONSTRUCTION.
EASIEST FITTED.



Cheapest and Best
Balance Made.

WRITE FOR CATALOGUE.

The Vanderbilt Sash Balance Co.,
CANANDAIGUA, N. Y.

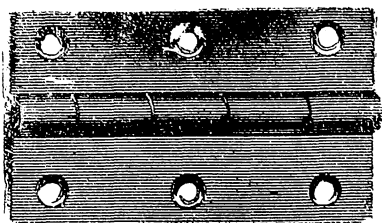
General Agents, Harmon & Dixon, 118 Chambers St. New York.

C. H. WOLFF,
177 William St., N. Y.



STENCIL DIES.

Send for Catalogue.



Cast Brass Butt Hinges

IN STOCK AND FOR SALE BY

W. & J. TIEBOUT,

Nos. 16 & 18 Chambers Street, New York,

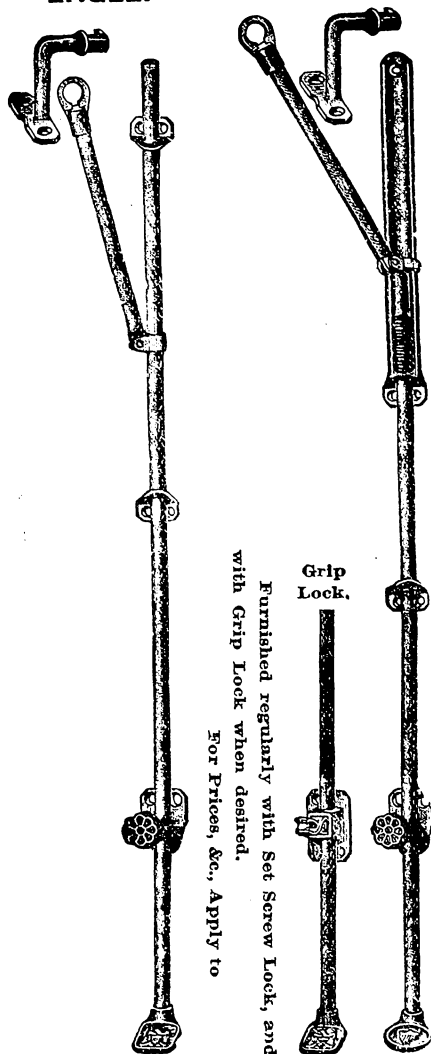
MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.**

TRANSOMLIFTERS

"EAGLE."

"SHIELD."



Furnished regularly with Set Screw Lock, and
with Grip Lock when desired.
For Prices, &c., Apply to

Grip
Lock.

**J. F. WOLLENSAK, PATENTEE
CHICAGO, ILLINOIS.**



BUY BRADLEY BRACKETS!!!

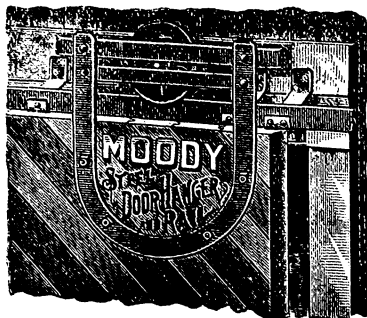
Your Customers will like them. They are made of steel and are not brittle. They are light, strong and artistic. They can be put up with nail and hammer. Write for prices.

PAT. NOV. 8,
1892.

ATLAS MFG. CO.,
New Haven, Conn.

VICTOR MFG. CO., Newburyport, Mass.

STEEL RAIL.



Showing one-half set of hangers attached to door.



The Only Bracing Bracket Made.

HANGERS.	PRICE-LIST.	Per Doz. prs.
No. 5, to run 6 feet, 3 1/4 in. wheel,	-	\$10.00
No. 6, to run 10 feet, 4 1/4 in. wheel,	-	15.00
No. 7, to run 15 feet, 5 1/4 in. wheel,	-	22.00
RAIL, per foot.....		6 1/2 cents

WHY USE WOODEN OR HEAVY STEEL BLOCKS

WHEN THE STEEL AND IRON

TACKLE BLOCKS

—MADE BY—

The Cleveland Block Co.

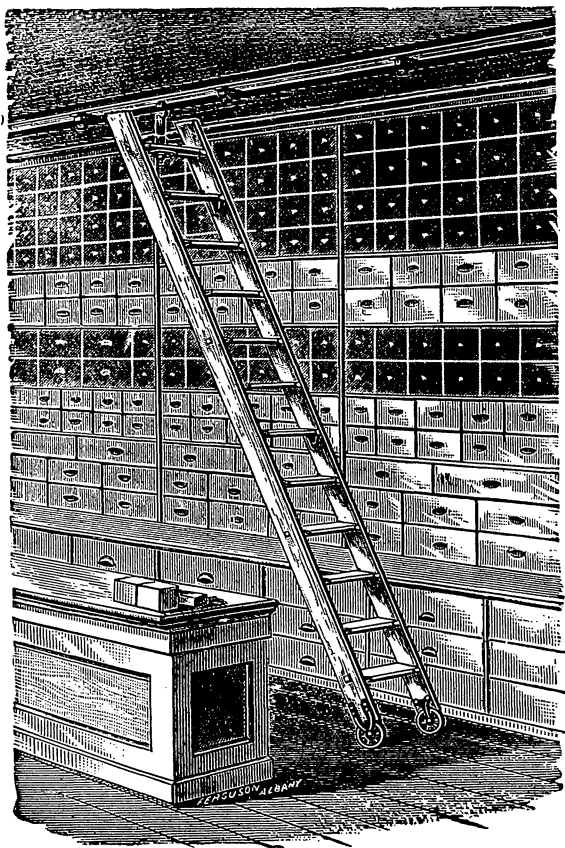
CLEVELAND, OHIO, U. S. A.,

ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable

General Agents: Topping Brothers, 92 Chambers Street, New York,
The H. Channon Co., 22 Market Street, Chicago.
New England Agents, - Dodge, Haley & Co., 212 High Street, Boston.

THE "NOISELESS" STORE LADDER.

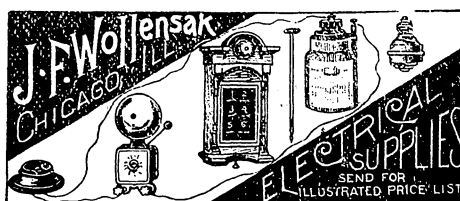


The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

M. CROISSANT,

ALBANY, N. Y.

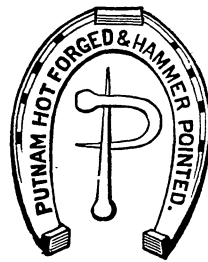


Highest Award

FOR
Supreme Excellence

TO

The **PUTNAM** Hot-Forged and
Hammer-Pointed Horse **NAILS,**



At the *World's Columbian Exposition* at Chicago. A medal and diploma worded:
"Supreme excellence in material, method in manufacture, and quality of finished product; elasticity and smoothness combined with holding power in clinch.
It allows the use of very small nails."

There is nothing beyond "supreme excellence," nor is there anything comprised in a horse nail, except the "material from which it is made," "the method of manufacture," and "quality of finished product."

Putnam nails, by their "elasticity," give slightly to the expansion and contraction of the hoof while the horse is in motion; by their "smoothness," do not enlarge the nail holes in the hoof, while their "supreme excellence," in "holding power in the clinch," enables them to hold the shoe in the hardest service until worn out.

By the "use of small nails," large holes are avoided and money saved to the smith.
Thus it will be seen that the officials of the *World's Columbian Exposition* recognize what qualities go to make up a good horse nail and that only the "Putnam" contains them all.

PUTNAM NAIL CO.,
Neponset, Boston, Mass.



TRADE MARK.



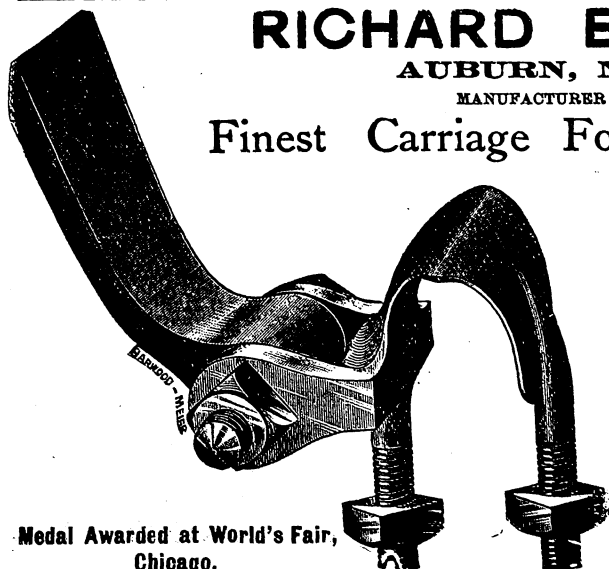
All Tags and Labels on Covert Goods bear the above Trade-Mark, and are sold by all Leading Jobbers in General and Saddlery Hardware at Manufacturers' Prices.



COVERT MFG. CO.,
WEST TROY, N. Y.

RICHARD ECCLES,
AUBURN, N. Y.,
MANUFACTURER OF

Finest Carriage Forgings, Coup-
lings, Clips,
King Bolts,
Fifth Wheels,
&c. Manufact-
ure a full line
Special Drop
Forgings.



Medal Awarded at World's Fair,
Chicago.

Send for New Catalogue for
Season 1893-94



FROST'S ANTI-RATTLER

Pat. Jan. 20, 1880.

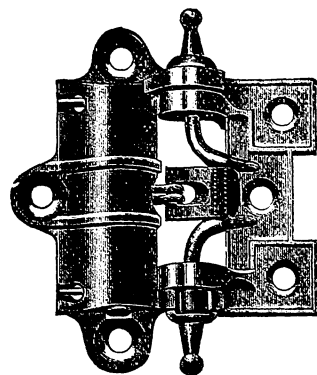
Cut One-half Size.

Sample pair sent to any hard-
ware or saddlery firm by ad-
dressing

The Frost Thill Spring Co.,
Boston, Mass.

NEW IDEA SPRING HINGE

Holds the door strongest when
closed.



Resistance gradually de-
creases in opening

and increases in closing the door.

A covered (patented) hold-back Spring Hinge. Full
particulars, free Sample and Prices by mentioning
this paper.

STOVER MANUFACTURING CO.,
145 River St., Freeport, Ill.

SASH WEIGHTS

E. E. BROWN & CO.,

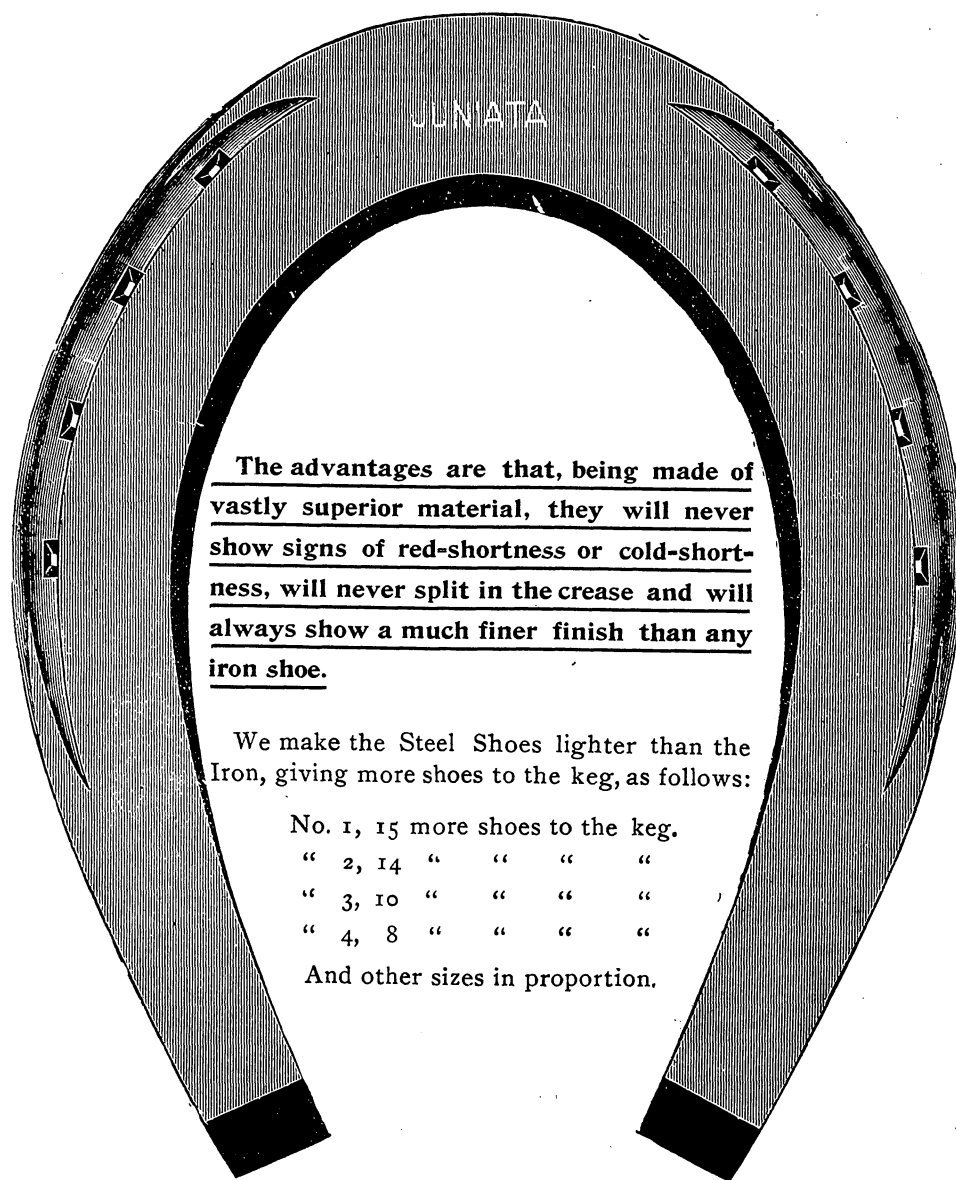
McKean and Meadow Sts.,

PHILADELPHIA, PA.

STEEL HORSE SHOES.

SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

" 3, 10 " " " "

" 4, 8 " " " "

And other sizes in proportion.

No. 2 EXTRA SWAGED FRONT.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

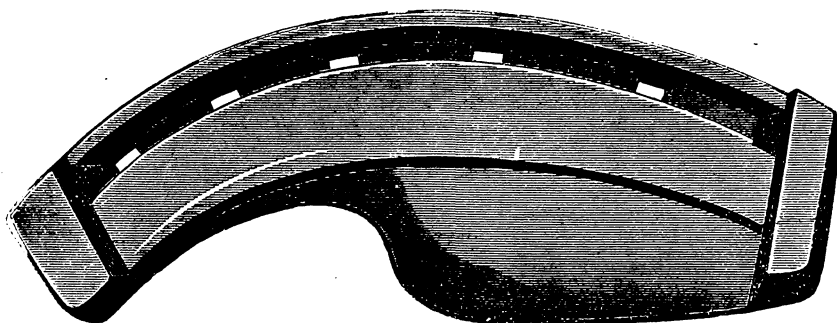
We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

SHOENBERGER & CO.,

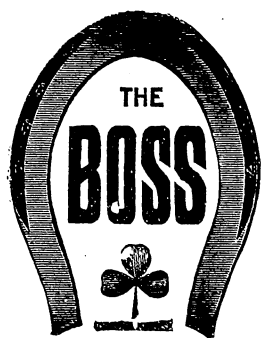
JUNIATA IRON AND STEEL WORKS, - - - PITTSBURGH, PA.

FORGED
OX
SHOES.



IT IS JUST RIGHT.

Made under Deeble's Patent, Aug. 9, 1887.



**BRYDEN HORSE SHOE CO.,
CATASAUQUA, PA.**

J. C. McCARTY & CO., Agents - 97 Chambers Street, New York.

MANUFACTURED BY

The Screws of all the Clamps are made to reach the lower number.
SEND FOR CATALOGUE OF FULL LINE OF MACHINISTS' TOOLS.

C. W. LE COUNT, MANUFACTURER, SO. NORWALK, CONN., U. S. A

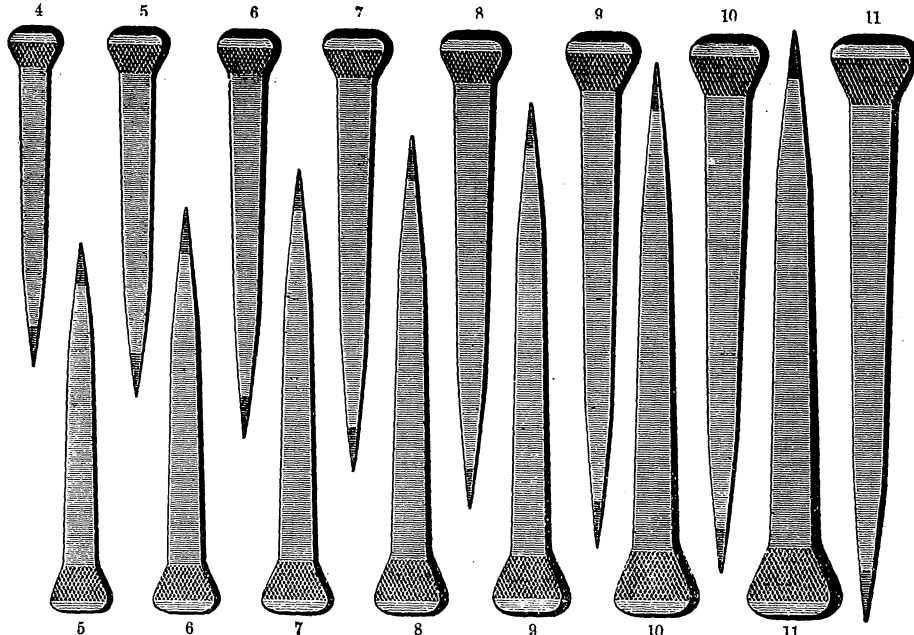
These goods are for sale by CHAS. CHURCHILL & CO., Ltd., 21 Cross St., London, England.

LEEDS, ROBINSON & CO., General Agents,
4 Liberty Square, Boston, Mass.

HIGHEST AWARD
AT
WORLD'S COLUMBIAN EXHIBITION.
CAPEWELL HORSE NAILS.

"Tensile strength one-half greater than that of any other nail made."

CITY HEADS.



REGULAR HEADS.

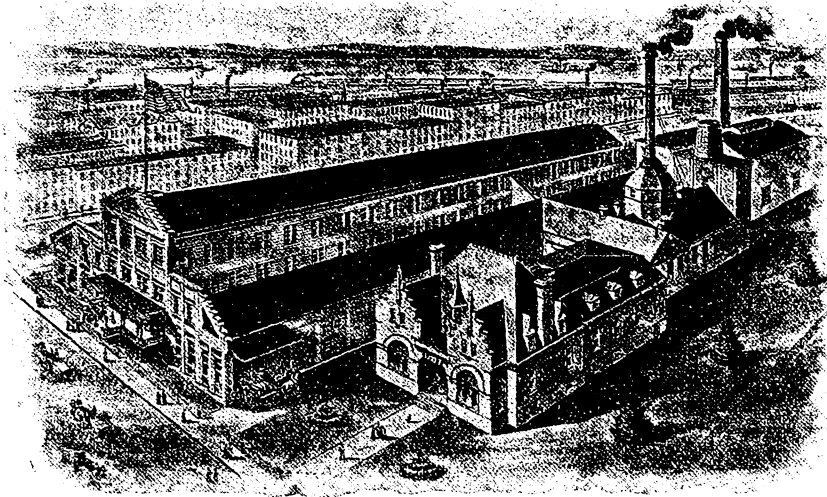
The Capewell Patent Corrugated Horse Nail.

Needs no
Clinching.



Made in
All Sizes.

"The Coming Nail to be Used."—JOHN KIERNAN,
Chief Farrier and Instructor in Horseshoeing, U. S. Army.



The Capewell Horse Nail Co.,
HARTFORD, CONN.

H. D. SMITH & CO.,

Plantsville, Conn.,

MANUFACTURERS OF THE BEST QUALITY

CARRIAGE MAKERS' HARDWARE,

MANUFACTURE THE LARGEST VARIETY OF

FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

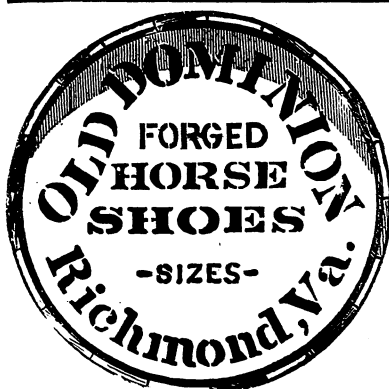
Send for Price and Illustrated List of

CHAMPLAIN

Manufactured by the NATIONAL HORSE NAIL CO.,
VERGENNES, VERMONT.

All Sizes. All Patterns. All Warranted. Sold Everywhere.

J. C. McCARTY & CO., Agents. New York.



Elegant Iron.
Beautiful Shape.

HORSE SHOES,
Light, Medium and Heavy.
MULE SHOES,
Light, Medium and Heavy.

Illustrated booklet and prices to all
parts of the world on application.

OLD DOMINION IRON AND NAIL WORKS CO.,

ARTHUR B. CLARKE, President.

Chicago Office, 45 La Salle St.

Richmond, Va., U. S. A.

AXLEINE



is a fine quality of Axle Grease put up in square tin boxes containing one pound; beautifully decorated in assorted colors; designed especially for the Hardware Trade. Showy and attractive shelf goods.

Send for sample and prices.

LOVELL, TRACY & CO. 71 Asylum St. Hartford, Conn.

Crescent
Horse and Mule Shoes,
BAR IRON.

CRESCENT HORSE SHOE
IRON CO.

Max Meadows, Va.

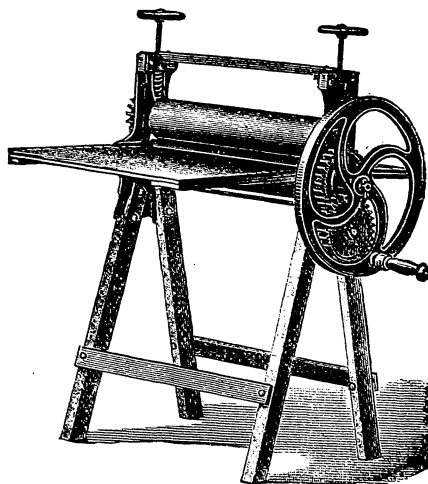
P. F. BURKE, C. F. DEWICK & CO.
Successor to
Manufacturer of
PATENT STEEL
(Blunt and Sharp)
TOE-CALKS.
—ALSO—
BURKE'S IMPROVED
HORSESHOERS'
FOOT VICE.
Send for Circulars.
360 Dorchester Av. Die for Welding
BOSTON, MASS. Sharp Calks.

The Family Mangle.

WARRANTED TO DO
Better Work than Hand-Work.

SAVES all the fuel,
two-thirds the work.
Keeps the linen whiter.

We Guarantee Every Machine.



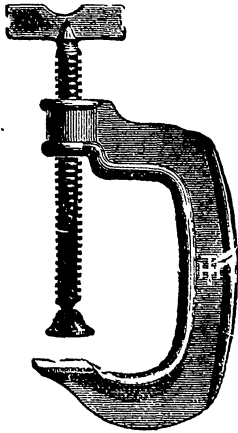
Send for descriptive circular to
S. C. Johnson, Racine, Wis.
Agents Wanted.

The Practical Polish and Varnish Maker.
By H. C. STANDAGE. A treatise containing 750 receipts and formulae for the manufacture of varnishes, polishes, &c. 12mo, cloth.....\$2.50
For Sale by DAVID WILLIAMS, 96-102 Reade St., N. Y.

BUFFALO SCALE CO., Buffalo, N. Y. SCALES OF ALL KINDS.

Patented Articles of MALLEABLE IRON.

NEW pattern Heavy Screw Clamps.
Strongest in the market.



HAMMER'S MALLEABLE IRON OILERS, 3 Sizes.

HAMMER'S MALL. IRON HAND LAMPS.

HAMMER'S M. I. HANGING LAMPS.

HAMMER'S ADJUSTABLE CLAMPS.

For sale by all the principal Hardware Dealers.
Send for Price List.

MALLEABLE IRON CASTINGS

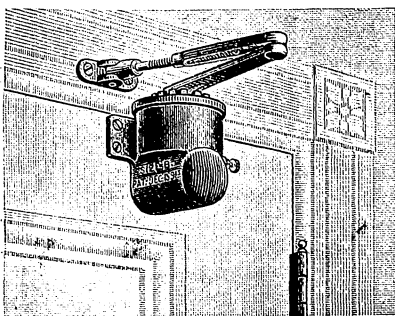
of superior quality, and Hardware Specialties in
Malleable Iron made to order.

HAMMER & CO.
Branford, Conn.

THE WILCOX & HOWE COMPANY,
BIRMINGHAM, CONN.,
MANUFACTURERS OF

**A Full Line of Carriage Hardware
ALSO SPECIAL FORGINGS.**

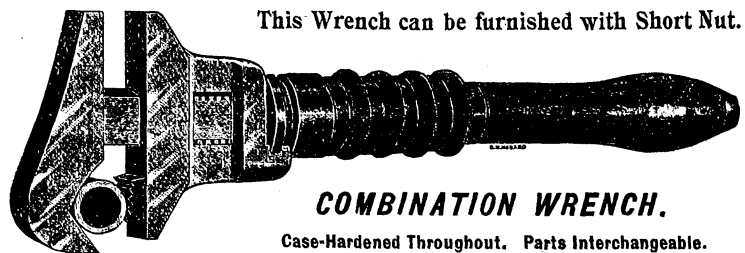
Estimates cheerfully given. Send for Catalogue



Bardsley's Liquid Door Check and Spring

Perfect in action, durable, neat in appearance, low
in price and fully warranted. Responsible Agents
wanted in the principal cities.

J. BARDSLEY, 149 & 151 Baxter St., New York.



This Wrench can be furnished with Short Nut.

COMBINATION WRENCH.

Case-Hardened Throughout. Parts Interchangeable.

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the
requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.
For Circulars and Price-List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass., U. S. A.



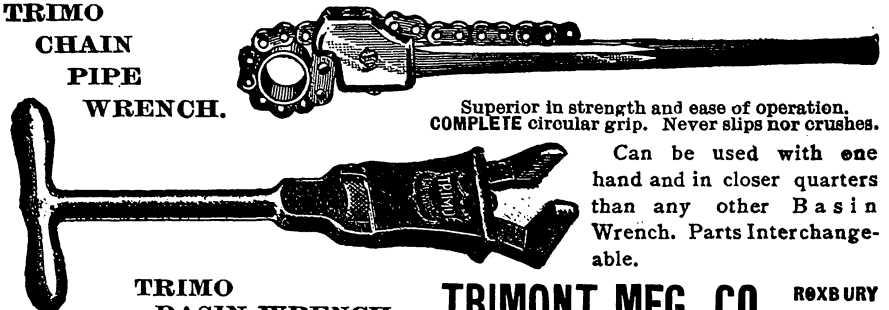
TRIMO PIPE WRENCH,

Forged Steel.

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no
trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



Superior in strength and ease of operation.
COMPLETE circular grip. Never slips nor crushes.

Can be used with one
hand and in closer quarters
than any other Basin
Wrench. Parts Interchange-
able.

TRIMO
BASIN WRENCH.

**TRIMONT MFG. CO., ROXBURY
MASS.**

BROCK'S PATENT DROP FORGED CHAIN PIPE WRENCH.

LATEST IMPROVED MODEL.



Seven Sizes. Adapted for pipe from $\frac{1}{8}$ in. to 12 in. diameter. The best
pipe wrench now offered for sale.

REVERSIBLE, INTERCHANGEABLE, DURABLE, ECONOMICAL.

J. H. WILLIAMS & CO.,

Makers of Forged

Engineers' Wrenches, Lathe Dogs, Keys, Thumb Screws and Collars.

Special Drop Forgings of Every Description from Iron, Steel, Copper and Bronze.

9 to 15 RICHARDS STREET,

BROOKLYN, N. Y.

SINGLE END WRENCHES



For Standard Hexagon Nuts

Finished or Unfinished

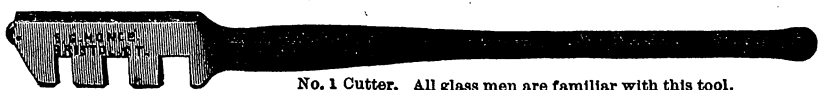
DROP FORGED from BEST BAR STEEL
in Lengths from 6 to 24 inches

Taking Nuts for $\frac{1}{4}$ up to and including Nuts for $1\frac{1}{4}$ inch bolts

THE BILLINGS & SPENCER CO.

HARTFORD, CONN.

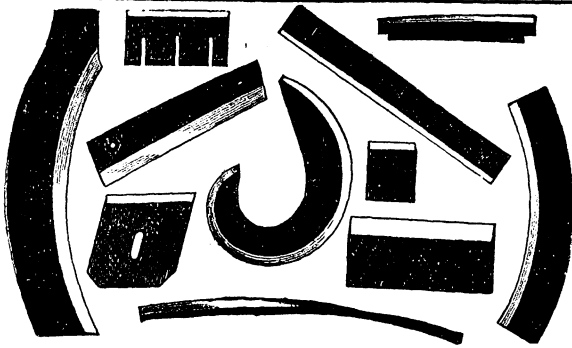
MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS,



No. 1 Cutter. All glass men are familiar with this tool.

S. G. MONCE.

BRISTOL, CONN.



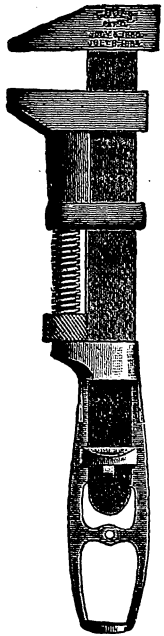
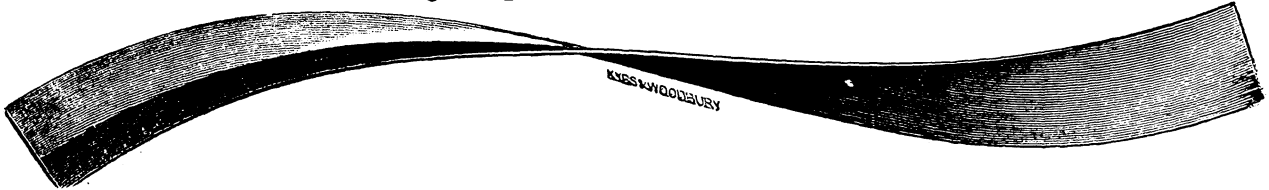
LORING COES & CO.

WORCESTER, MASS.

Manufacturers of **MACHINE KNIVES.**

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.

End view of Plated Stock for Dies, Lawn Mower Knives, Blades Etc., showing how the Steel is laid.

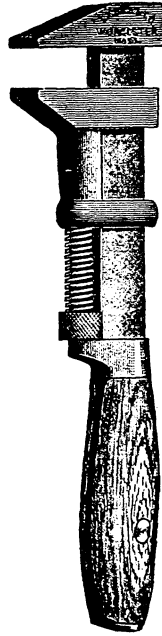


L. COES'

Genuine Improved
KNIFE HANDLE
PATENT

Screw Wrenches

MANUFACTURED BY
COES WRENCH CO.,
WORCESTER, MASS.



Established in
1839.
Registered
March 31, 1874.

Patented July
6, 1880.
Patented July
8, 1884.

Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

— Straight Bar, Extra Long Nut for Screw in Jaw. —

The **BEST MADE** and **STRONGEST WRENCH** in the MARKET.

J. C. McCARTY & CO.,
JOHN H. GRAHAM & CO. } New York Agents.

THE COST OF MANUFACTURES

—) AND THE (—

ADMINISTRATION OF WORKSHOPS,

Public and Private.

BY CAPT. HENRY METCALFE.

322 Pages; 6 1/4 x 9 1/2 inches.

CLOTH, \$5.00

This work is an effort to correct some of the wrong, and consequently unprofitable, methods of conducting manufacturing establishments, and proposes plans for more correct ones. A system of mechanical bookkeeping, based on the card catalogue method, dispensing with the use of books, by which the cost of manufactures may be promptly determined, either in gross or detail, as to component parts and operations thereon. Comprising a simple method of recording all dealings with material which relate to its procurement, expenditure or possession. Applied, with numerous practical illustrations, to the trust, accountability for public property and funds required of the U. S. Ordnance Department, with a review of its present practice. Illustrated with tables, forms of cards, etc.

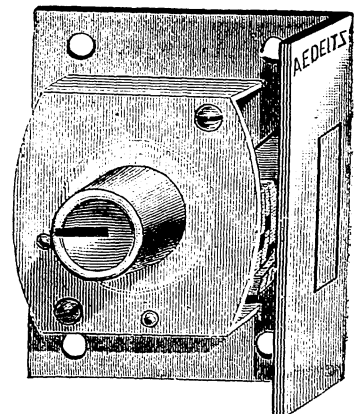
Any Book Published Sent, Post-paid, on Receipt of the Price, by

DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade Street, New York

• **IMPROVED MINE LAMP** •
FOR ANTHRACITE AND BITUMINOUS MINING
6 DIFFERENT STYLES OF SPOUTS.
SAMPLE 15¢.
SEAMLESS BRASS COLLAR
BRASS HINGE
Lid Solid
No SOLDERING
B. E. LEONARD, Scranton, Pa.

A. E. DEITZ



No. 51 Lock.

J. C. McCARTY & CO., Agents,

97 Chambers and 81 Reade Sts., New York.

Factory, BROOKLYN, E. D., N. Y.

NO MORE DULL CARVERS.
THE BEST TABLE TOOL FOR KEEPING CARVING KNIVES IN GOOD CUTTING ORDER—THE EMPIRE VITRIFIED STEEL, WITH 1/4" BACK BONE.
CANNOT BREAK—LASTS A LIFETIME AND WILL NOT GLAZE.
SENT BY MAIL FOR 50¢.
EMPIRE PORTABLE FORGE CO.
LANSINGBURGH, N. Y.

N. Y. Office, 103 Chambers St., W. H. QUINN, Manager.

IF YOU WANT



Just what your customers demand,
A better quality of goods
And more for your money
Than can be obtained elsewhere,
In the line of Wheelbarrows,
Scrapers, Trucks, Steel Sinks, &c., &c.,
We would suggest that you write to

The
Kilbourne & Jacobs Mfg. Co.
of
Columbus, O., U. S. A.



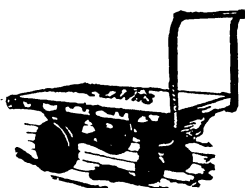
QUEEN LIL BOTHERS STATESMEN,



NEW CATALOGUE.

—BUT—
“QUEEN B” suits
TRADESMEN.

SWEATT MFG. CO., - MINNEAPOLIS, MINN.



TRUCKS of all kinds. Mounted on rubber or iron wheels. Trucks made to order. Write for prices. Catalogues free.

G. P. CLARK, Box 0,
Windsor Locks, Conn

The Cockburn Barrow and Machine Co.

OFFICE AND WORKS:

234 to 240 Eleventh St., - JERSEY CITY, N. J.

NEW CONCRETE MIXING MACHINES.

Coal and Ash Buckets, Coaling Tubs, Coal and Coke Cars, Patent Tubular Frame Wheelbarrows, Furnace Charging Barrows and Cars, Sheet Iron Work of every description, Patent Power Punching Machines, Every description of General Forgings, Dimpfel Blowers, Machine Work



STEEL BARROWS.

LANSING WHEELBARROW CO.

LANSING, MICH.

BOOKS

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street. New York.

ALL STEEL WHEELBARROWS & SCRAPERS

MANUFACTURED BY

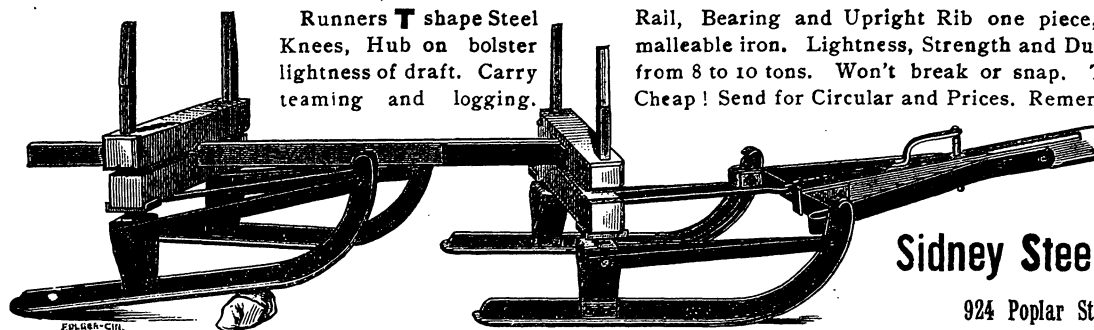
AMERICAN STEEL SCRAPER CO.

1104 Court Street, SIDNEY, O.



Write for Catalogue



HASLUP'S OSCILLATING STEEL BOB SLED AND RUNNERS.

Runners T shape Steel Knees, Hub on bolster lightness of draft. Carry teaming and logging.

Rail, Bearing and Upright Rib one piece, complete with Steel malleable iron. Lightness, Strength and Durability combined with from 8 to 10 tons. Won't break or snap. The boss for farm use Cheap! Send for Circular and Prices. Remember also that we make

**BARROWS
AND
SCRAPERS.**

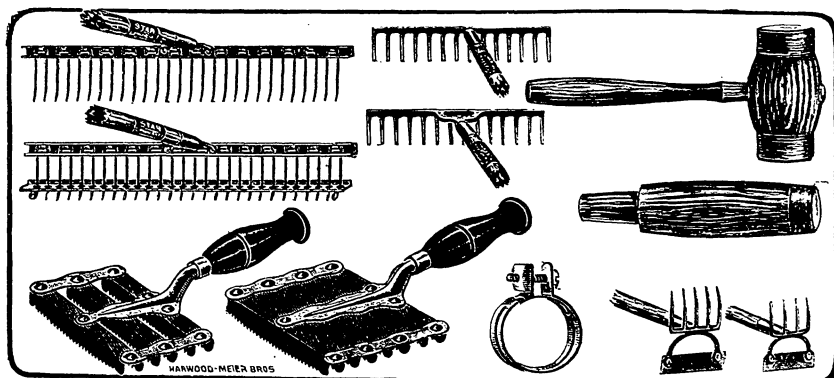
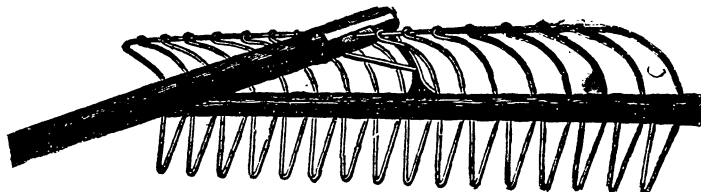
Sidney Steel Scraper Co.,

924 Poplar Street, SIDNEY, O.

LAWN RAKES. The "GEM" AND "DAVIS."

Both good and each the best. If you have not stocked up, better do so at once. Our prices are low.

SCHAEFFER & CO., Dayton, O.



SYRACUSE SPECIALTY MFG. CO.,

SYRACUSE, N. Y.

MANUFACTURERS OF

Curry Combs, Lawn Rakes, Hose Bands, Rawhide Ferruled Mallets and Chisel Handles, Malleable Rakes and Weeders, &c.

SURPLESS, DUNN & ALDER,

97 Chambers St., New York,

—DIRECT REPRESENTATIVES.—

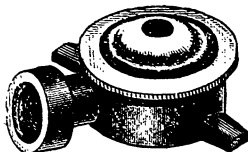


Japanese No. 12, Adjust.

**LAWN
SPRINKLERS.**

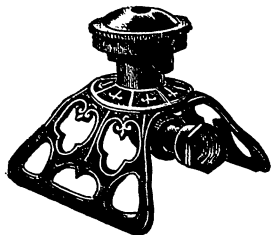
We manufacture the BEST and CHEAPEST Lawn Sprinklers in the World.

Cactus No. 9.



The only Sprinklers which have no revolving parts to leak or wear out. The only Sprinklers free from small holes, and which cannot become clogged with gritty substances. The only Sprinklers which are adjustable and will give a spray as fine as the mist of Niagara, or as heavy as the area of the supply pipe.

The best Sprinklers for high pressures, and the only sprinklers which will give satisfaction with low pressures. We also manufacture the old style revolving sprinklers, but for our own use would not have them.



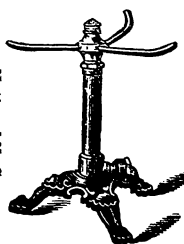
Cactus No. 5.

Ette & Henger Mfg. Co.

ST. LOUIS, MO.

SEND FOR DESCRIPTIVE CIRCULARS.

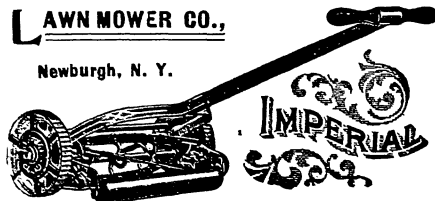
National N. G.



COLDWELL

LAWN MOWER CO.,

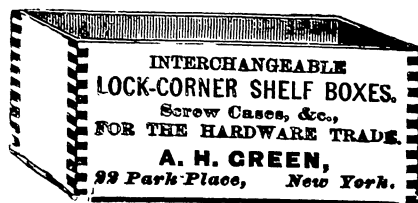
Newburgh, N. Y.



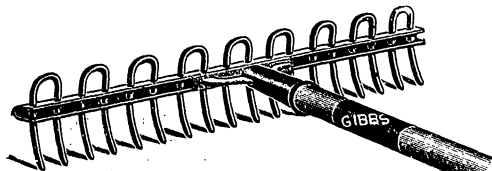
THE BEST MOWER MADE.

The Lightest Running Mower in the World.

This is the only Lawn Mower that stood the test of working the entire season on the Columbian Exposition Grounds without any repairs.



INTERCHANGEABLE
LOCK-CORNER SHELF BOXES.
Screw Cases, &c.,
FOR THE HARDWARE TRADE.
A. H. GREEN,
99 Park Place, New York.

The BOSS GARDEN RAKE

LAWN RAKES, GARDEN RAKES,

CURRY COMBS,

LAWN SPRINKLERS,

POST HOLE DIGGERS.

possesses merits not found in other makes.

Strong. Cheap.

The double teeth are used for breaking clods and will pulverize the ground finer and more quickly.

ALL STEEL - TINNED.

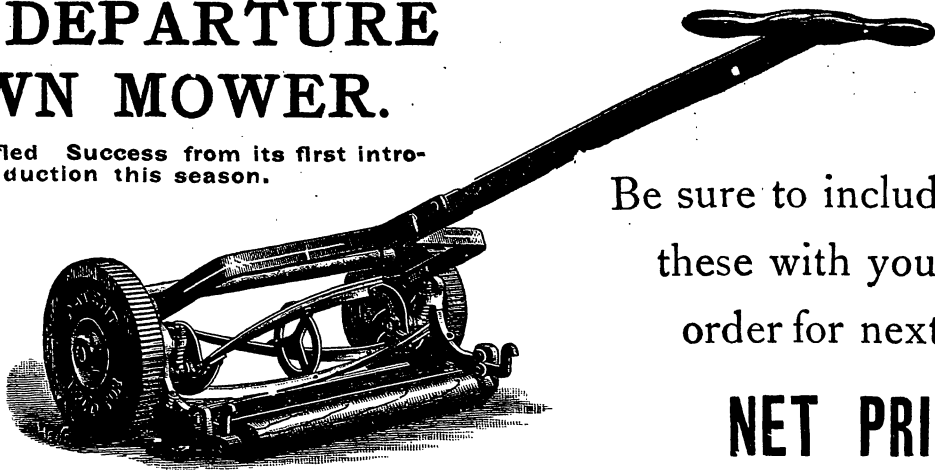
Can be used as a lawn rake, around stables and on gravel walks.

Send for Prices.

GIBBS MFG. CO., Canton, Ohio.

NEW DEPARTURE LAWN MOWER.

An Unqualified Success from its first introduction this season.



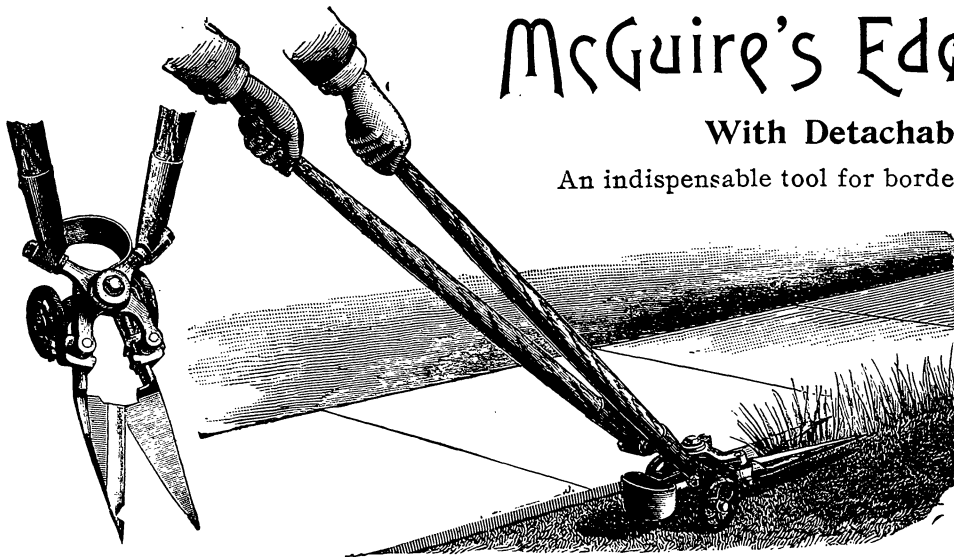
Be sure to include a line of these with your Mower order for next season.

NET PRICES.

Also the celebrated and always popular line of Mowers: *PENNSYLVANIA, CONTINENTAL, GREAT AMERICAN, NEW QUAKER CITY.*

SUPPLEE HARDWARE CO.,

PHILADELPHIA.



McGuire's Edging Shears

With Detachable Handles.

An indispensable tool for borders and edges where the ordinary mower cannot cut. Invaluable for trimming shrubbery, both high and low. If desired, the handles may be readily detached, and the shears used by hand in the ordinary manner. First-class best quality shears, nicely finished. Packed $\frac{1}{2}$ Doz. in case. List price, \$10.00 each.

MANUFACTURED BY

Dille & McGuire Mfg. Co.,
RICHMOND, IND.

**Chadborn & Coldwell
Mfg. Co.,**

NEWBURGH, N. Y.,
Sole Manufacturers of—



New Model
AND
Excelsior
LAWN
MOWERS
ALSO
The Rival,
The O K,
Etc., Etc.

Send for Illustrated Catalogue.

**To Our Many Patrons.
ONE AND ALL**

We greet you with the compliments of the season.

F. E. KOHLER & CO.,
MANUFACTURERS

Post-Hole Diggers (6 varieties), Reversible Lawn Rakes (4 varieties), Saw Sets, Curry Combs, etc.

THE F. & N. MFG. CO.,

Manufacturers of

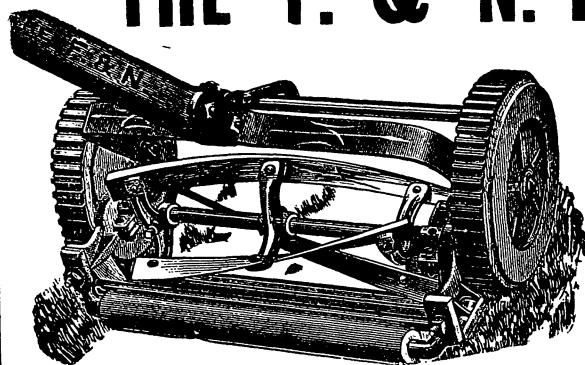
**Lawn Mowers, Lawn
Sweepers
and Grass Catchers,**

RICHMOND, IND., U.S.A.

The F. & N. High Grade Lawn Mower. Fully Guaranteed.

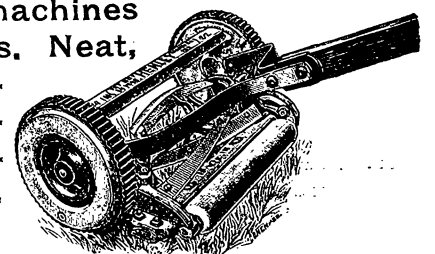
AGENTS

Woodrough & Hanchett Co.,
Chicago, Ill.
C. F. Guyon Co., Ltd., New York.
Woodrough, Mansfield & Co.
Boston, Mass.



Henley's Lawn Mowers

First-class high grade machines made of the best materials. Neat, symmetrical, strong, durable and unexcelled in construction and ease of operation. Does perfect work. For prices address



M. C. HENLEY, Sole Mfr., Richmond, Ind., U. S. A

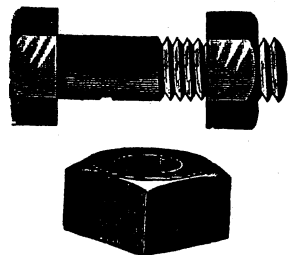
EASTERN REPRESENTATIVES: H. S. Earle, 110 and 112 N. Warren St., Syracuse, N. Y.; Wm. H. Cole & Sons 13 S. Charles St., Baltimore, Md.; Carpenter & Bayles, 91 Chambers St., New York City.



WROUGHT WASHERS

Every Washer
FLAT
With hole in
TRUE CENTER.

Packed in kegs for general trade, or in 1 and 5 lb. boxes for hardware trade.



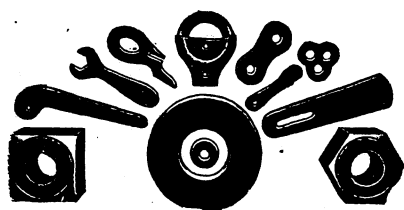
MACHINE BOLTS. HOT PRESSED NUTS.

Highest
Standard of
EXCELLENCE.

It will pay you to correspond with us.

MILTON MANUFACTURING CO.,

MILTON, PA.



J FRED WILSON, Worcester, Mass.

Metal Punching and Die Work

Cold Punched Nuts and Washers
for all Purposes.

SEND FOR PRICES ON

SPECIALTIES IN LINE OF PRESS WORK.

AMERICAN BOLT COMPANY,

Manufacturers of

BOLTS AND NUTS, COACH OR LAG SCREWS

Bridge Bolts, Car Bolts, Track Bolts, Washers, Chain Links, BUILDING BOLTS
AND IRONS OF ALL KINDS, Forgings, Bolt and Nut Machinery, &c.

JAMES MINTER, President.

LOWELL, MASS.

MILES F. BRENNAN, Treas.

LITTLE GIANT

Traveling Lawn Sprinkler.

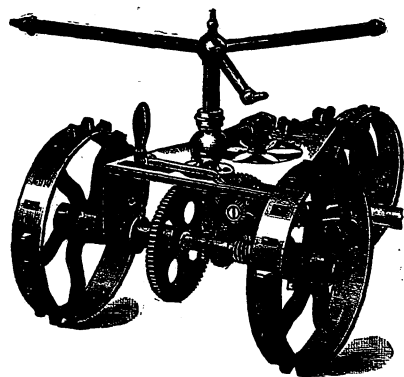
PATENTED.

Can be set to travel anywhere from 15 to 500 feet
per hour, either on a straight line or in a circle, and
can be gauged to throw water over a swath 5 to 50
feet in width.

Highest Award at World's Columbian Exhibition.

SEND FOR CIRCULAR.

PORTLAND LAWN SPRINKLER CO.,
PORTLAND, ME.



The English and American Mechanic:

AN EVERY-DAY HAND-BOOK FOR THE WORKSHOP AND THE FACTORY.

CONTAINING

Several Thousand Receipts, Rules and Tables indispensable to
the Mechanic, the Artisan and the Manufacturer.

By B. Frank Van Cleve.

A new, revised, enlarged and improved edition, edited by Emory Edwards, M.E.

ILLUSTRATED WITH EIGHTY-FIVE ENGRAVINGS.

In one volume, 500 pages, 12mo, closely printed, containing a vast body of information of value
to all practical men. Elegantly bound in scarlet cloth, gilt. Price \$2.00.

SENT POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS, Bookseller and Publisher,

96-102 Reade Street, NEW YORK.

K

EXPANSION BOLTS.



Manufacturers of Single and Double.
For fastening all kinds of Structure to Brick and Stone
Work. Catalogue furnished on application.
STEWART & ROMAINE MFG. CO., - Philadelphia.

HAY KNIVES

SEASON OF 1892-93.

"LIGHTNING"

(Reg. Trade-Mark No. 9583.)

"BLIZZARD"

Reg. Trade-Mark No. 19,390.

It pays to han-
dle **FIRST**
CLASS
goods.

Write us early
for prices and
terms.



Sole Manufacturers,

The **HIRAM HOLT COMPANY**
EAST WILTON, MAINE.

The New Britain Hardware Mfg. Co.

New Britain, Conn., U. S. A.

MAKERS OF ALL KINDS OF

Special Machine Screws, Studs, Bolts, &c.
BICYCLE PARTS,
SPECIAL HARDWARE.

Pattern Makers' Dowels and Emery Wheel Dressers.
Electro, Brass and Nickel Plating.

P. J. Conroy & Co.,

Paschall, PHILADELPHIA.

"CONROY"

Refrigerator Door

Fasteners

Have rapidly supplanted all
others.

Refrigerator Trimmings.



Pat. Dec. 15, '85

WM. H. HASKELL, PRESIDENT.

E. S. MASON, TREASURER.

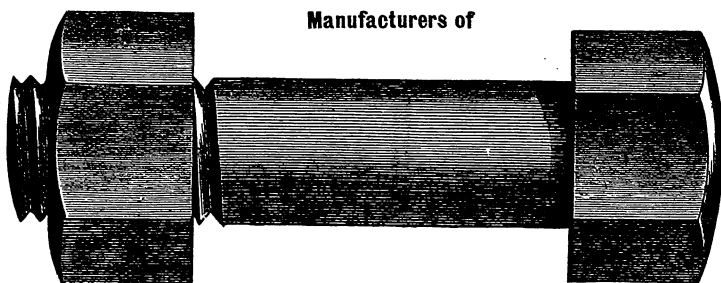
D. A. HUNT, AGENT.

WM. H. HASKELL CO.,
 —MANUFACTURERS OF—
GIMLET POINT COACH SCREWS  **Bolts, Cold-Punched Nuts and Washers, SUITABLE FOR MACHINERY OF ALL KINDS.**

Office and Works: 451 Main St., PAWTUCKET, R. I., U. S. A.
HENRY B. NEWHALL CO., Agents,
 105 CHAMBERS STREET, NEW YORK. - 47 PEARL STREET, BOSTON.

WORCESTER MACHINE SCREW CO., Worcester, Mass.

SET,
CAP AND
MACHINE
SCREWS.



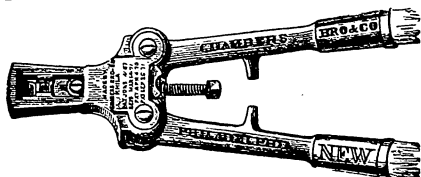
Manufacturers of

STUDS FOR
STEAM
ENGINE,
PUMPS, &c.

EXPANSION BOLTS.



For Fastening all Kinds of Structure to Brick and Stone Work.
 Patentee and Mfr, **ISAAC CHURCH.**
 Toledo, O.
 Send for Catalogue.



BOLT & RIVET CLIPPERS,

For cutting off the ends of Bolts and Rivets.
 Liberal discounts to the trade.

CHAMBERS BROTHERS COMPANY

52d St., BELOW LANCASTER AVE.,
 PHILADELPHIA, PA.

WM. H. JACOBUS,

No. 90 Chambers St., New York.
 New York Office of

J. F. Wollensak.
 Barnes Mfg. Co.
 Penn Lock Works.
 Lorenz Bommer.
 Palmer Hdw. Mfg. Co.
 Dibble Mfg. Co.
 Wire Goods Co.
 Garritt & Beach.
 Prindle Mfg. Co.
 Tuck Mfg. Co.
 Henis Vegetable Press.
 Dille & McGuire Mfg. Co.
 National Rivet Works.
 Lufkin Rule Co.
 Wolcott Hdw. Co.
 Zimmerman's Blind Adjusters.
 Burnside Cedar Faucets.
 Fibre Head Mallet.
 Glazier's Patent Hocks.

RIVETS
 OF EVERY
 DESCRIPTION, FIRST QUALITY.

W.P. TOWNSEND & CO.
 NEW BRIGHTON, PA.

Illustrations of various rivet types: COUNTERSUNK HEAD, ROUND HEAD, FLAT HEAD, STEEP HEAD, CONE HEAD, ROSE HEAD, TRUSS HEAD, WAGON BOX HEAD, BELT RIVET.

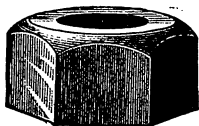
5lb. 6lb. 7lb. 8lb. 10lb. 12lb.

ESTABLISHED 1865.

J. H. Sternbergh & Son, READING PA.

MANUFACTURERS OF BOLTS, NUTS, WASHERS, RIVETS.

Including Machine Bolts, Carriage Bolts, Bridge Bolts and Car Bolts,
THE HARVEY PATENT GRIP-THREAD TRACK BOLT, Soft Steel Bolts with Cold Rolled Thread, Bolt Ends, Turnbuckles, Sleeve Nuts, Lag Screws, Set Screws and Tap Bolts and every variety of screwed work,
BOILER, BRIDGE AND SHIP RIVETS, Square and Hexagon Nuts of all kinds and sizes, Plate Washers, Belt Lacing Machines, Rods and Irons for Bridges and Buildings, Merchant Bar Iron, etc., etc.
 Branch Establishment, **THE KANSAS CITY BOLT & NUT CO.**, Kansas City, Mo.



PORTCHESTER BOLT & NUT CO.

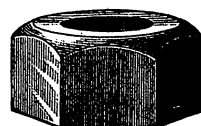
Port Chester, N. Y.

MANUFACTURERS OF

BOLTS NUTS, RIVETS and WASHERS

CHAMFERED AND TRIMMED.

SQUARE AND HEXAGON NUTS A SPECIALTY.



CLASSIFIED LIST OF ADVERTISERS.

Air Chambers, Copper.

Emory, P. P. Mfg. Co., Springfield, Mass.

Air Compressors.

Norwalk Iron Works, S. Norwalk, Conn.
Band Drill Co., 28 Park Place, N. Y.

Air Moving Machinery.

Howard & Morse, 45 Fulton, N. Y.

Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.
Pittsburgh Reduction Co., Pittsburgh, Pa.
Scovill Mfg. Co., Waterbury, Conn.

Aluminum, Brass and Bronze.

Gaylord, F. L. Co., Ansonia, Conn.
Haight & Clark, Albany, N. Y.
St. Louis Bronze & Aluminum Works, St. Louis, Mo.

Analytical Chemists.

Britton, J. Blodgett, Philadelphia, Pa.
Moore, Dr. Gideon E., 221 Pearl St., N. Y.

Anti-Friction Metals.—See Babbitt Metal.

Anvil and Vise (Combination).

Fulton Iron & Engine Works, Detroit, Mich.

Apple Parers.

Goodell Co., Antrim, N. H.

Arms and Ammunition.

Forehand Arms Co., Worcester, Mass.
Harley & Graham, 313 & 315 Broadway, New York.
Ideal Mfg. Co., New Haven, Conn.
Stevens, J., Arms and Tool Co., Chicopee Falls, Mass.
Union Metallic Cartridge Co., 313 & 315 Broadway, N. Y.

Auctioneers.

Bissell, E. Son & Co., N. Y.

Axes.

Peck, A. G. & Co., Cohoes, N. Y.

Axle Grease.

Lovell, Tracy & Co., Hartford, Conn.

Axles, Springs, &c.—Manufacturers of.

Gantier Steel Dept. of Cambria Iron Co., Johnstown, Pa.
Wurster, F. W. & Co., Brooklyn, N. Y.

Babbitt Metal.

Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
Crown Smeltz Iron Co., Chester, Pa.
Hertz, T. & Son, St. Louis, Mo.
Keys, W. W. & R. M. Co., Bridgeport, Conn.
Reeves, Paul S., Philadelphia, Pa.

Bakers and Roasters.

Bronson Supply Co., Cleveland, Ohio.

Bale Ties.

Kilmer Mfg. Co., Newburg, N. Y.

Band Saw Machines.

Cross & Speirs Machine Co., Waterbury, Conn.

Barb Wire and Fence.

Gantier Steel Dept. of Cambria Iron Co., Johnstown, Pa.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Washburn & Moen Mfg. Co., Worcester, Mass.

Bar Iron, Manufacturers of.

Atlas-Standard Iron & Steel Co., Bridgeport, Conn.
Allentown Rolling Mill, Allentown, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Montour Iron & Steel Co., Danville, Pa.
Mahoning Valley Iron Co., Youngstown, Ohio.
Sternbergh, J. R. & Son, Reading, Pa.

Bellocks, Manufacturers of.

Bullock Bellocks Co., Cleveland, O.
Scott, Geo. M., Chicago, Ill.

Bells.

Bevin Bros. Mfg. Co., East Hampton, N. Y.

Bel Dressing.

Jos. Dixon Crucible Co., Jersey City, N. J.

Bel Fasteners.

Bristols' Mfg. Co., Waterbury, Conn.
Claffen Mfg. Co., Cleveland, Ohio.
Talcott, W. O., Providence, R. I.

Belting, Makers of.

Alexander Bros., 413 N. 3d., Phila.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.
Main Belting Co., Philadelphia, Pa.
N. Y. Belting & Packing Co., Ltd., N. Y.
Roberts Mfg. Co., Pittsburgh, Pa.
Quinta Belting Co., St. Louis, Mo.

Bending Rolls.

Wickes Bros., Saginaw, Mich.

Bicycles.

Eagle Bicycle Mfg. Co., Torrington, Ct.
Covell, Jno. P. Arms Co., Boston, Mass.
Peerless Mfg. Co., Cleveland, Ohio.
Pope Mfg. Co., Boston, Mass.
Read, Wm. & Sons, Boston, Mass.
Western Wheel Works, Chicago, Ill.

Bicycle Parts.

N. W. Britain Hdw. Mfg. Co., New Britain, Conn.

Bits and Braces.

National Mfg. Co., Wilkes-Barre, Pa.

Blocks, Tackle, Makers of.

Cleveland Block Co., Cleveland, O.
Fulton Iron & Engine Works, Detroit, Mich.

Blowers.

Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Surtzant, E. F., & Co., Boston, Mass.

Boiler Plates.

Carbon Steel Co., Pittsburgh, Pa.
Molva, Wm. & Sons, Reading, Pa.
Lukens Iron & Steel Co., Coatsville, O.
Pottstown Iron Co., Pottstown, Pa.

Boilers, Copper.

Randolph & Clowes, Waterbury, Conn.

Boilers, Steam.

Babcock & Wilcox Co., 30 Cortlandt, Edge Moor Iron Co., Wilmington, Del.
Harrison Safety Boiler Wks., Phila., Pa.
Phoenix Iron Works Co., Meadville, Pa.
Pollock, W. B. & Co., Youngstown, O.
Southwick Fdy. & Mch. Co., Phila., Pa.
Stirling Co., Chicago, Ill.
Wetherill, Robt. & Co., Chester, Pa.

Bolt Cutters.

Chambers Bros. Co., Philadelphia, Pa.
Howard Iron Works, Buffalo, N. Y.
Reece, Edw. F., Greenfield, Mass.
Wells Bros. Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Books.

Marine Review, Cleveland, Ohio.
Williams, David, 96-102 Reade, N. Y.
Wolcott & West, Syracuse, N. Y.

Boxes, Hdw. Shelf, &c.

Green, A. H., 22 Park Place, N. Y.

Box Straps and Corners.

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

Brackets.

Atlas Mfg. Co., New Haven, Conn.

Brass, Manufacturers of.

Ansonia Brass & Copper Co., N. Y.
Davol, John & Sons, 100 John, N. Y.
Plume & Atwood Mfg. Co., N. Y.
Randolph & Clowes, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.
Waterbury Brass Co., 236 B'way, N. Y.

Brass Butt Hinges.

Tiebout, W. & J., 16 & 18 Chambers, N. Y.

Brass Foundries.

Best, Fox & Co., Pittsburgh, Pa.
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
Cramp, Wm. & Sons, S & E. B. Co., Philadelphia, Pa.
Emory, P. P. Mfg. Co., Springfield, Mass.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Frain, E. T., Lancaster, Pa.
Haight & Clark, Albany, N. Y.
Keys, W. W. & R. M. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Phila., Pa.
Reeves, Paul S., Philadelphia, Pa.

Brass Goods.

Brass Goods Mfg. Co., 88 Chambers, N. Y.

Bridge Builders.

Berlin Iron Bridge Co., East Berlin, Ct.
Boston Bridge Works, Boston, Mass.
Wrought Iron Bridge Co., Canton, O.

Bronze (Tobin).

Ansonia Brass & Copper Co., 19-26 Cliff Street, N. Y.

Builders' Hardware.

Corbin, P. & F., New Britain, Conn.
Deitz, A. E., 97 Chambers St., N. Y.
Reading Hdw. Co., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Butchers' Steels.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.
Hoffman, C. & A., Philadelphia, Pa.

Butcher and Shoe Knives, Manufacturers of.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.
Goodeu Co., Antrim, N. H.
Wilson, John, Sheffield, England.

Butts and Hinges.

McKinney Mfg. Co., Allegheny, Pa.
Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.
Tiebout, W. & J., 16 Chambers, N. Y.

Calipers and Dividers.

J. Stevens Arms and Tool Co., Chicopee Falls, Mass.
Starrett, L. S., Athol, Mass.

Car Axles.

Roberts, A. & P. & Co., Phila.

Carboy Stands.

Hillebrand & Wolf, Philadelphia, Pa.

Car Wheels.

Whitney, A. & Sons, Phila.

Carriage Hardware, Makers of.

Covert's Saddlery Works, Farmer, N. Y.
Eccles, Richard, Auburn, N. Y.
Scranton Forging Co., Scranton, Pa.
Smith, H. D. & Co., Plantsville, Conn.
Wileox & Howe Co., Birmingham, Conn.

Cartridge Reloading Tools.

Ideal Mfg. Co., New Haven, Conn.

Casters, Wheel, &c.

Clark, G. P., Windsor Locks, Conn.

Castings, Iron and Steel.

Ames Sword Co., Chicopee, Mass.
Arcade Malleable Iron Co., Worcester, Mass.
Booth, The Lloyd, Co., Youngstown, O.
Burgess & Loxley, Buffalo, N. Y.
The Burr & Houston Co., Brooklyn, N. Y.
Cambria Steel—Cambria Iron Co., Johnstown, Pa.
Cheney, S. & Son, Manlius, N. Y.
Chester Steel Casting Co., Phila.
Chrome Steel Works, Brooklyn, N. Y.
Dayton Malleable Iron Co., Dayton, O.
Ette & Hanger Mfg. Co., St. Louis, Mo.
Eureka Cast Steel Co., Chester, Pa.
Flagg, Stanley G. & Co., Phila.
Gartland Foundry Co., Cleveland, O.
Haight & Clark, Albany, N. Y.
Hammer & Co., Branford, Conn.
Herrick, J. A., 284 Pearl St., N. Y.
Johnson, I. G. & Co., Spuyten Duyvil, N. Y.
Mahoning Fdry & Mch. Co., Danville, Pa.
Palmer & De Mooy, Cleveland, O.
Sessions Foundry Co., Bristol, Conn.
Spencer's, I. S., Sons, Guilford, Conn.
Standard Fdy. & Mfg. Co., Cleveland, O.
Standard Steel Casting Co., Thurlow, Pa.
Totten & Hogg Iron & Steel Fdry Co., Pittsburgh, Pa.
Union Mfg. Co., 103 Chambers St., N. Y.
Wetherill, Robt. & Co., Chester, Pa.
Woodruff, W. W. & Sons, Mt. Carmel, Conn.

Chains.

Bradlee & Co., Philadelphia, Pa.
Bridgeport Chain Co., Bridgeport, Conn.
Link-Belt Engineering Co., Phila., Pa.
McKay, Jas. & Co., Pittsburgh, Pa.

Chimneys.

Phila. Engineering Works, Phila., Pa.

Chisels, Manufacturers of.

Suck Bros., Millbury, Mass.
White, L. & I. J. Co., Buffalo, N. Y.

Chucks.

Cushman Chuck Co., Hartford, Conn.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Union Mfg. Co., 103 Chambers, N. Y.
Whitton, D. E. Mach. Co., New London, Conn.

Clamps.

Hammer & Co., Branford, Conn.
Le Count, C. W., So. Norwalk, Conn.

Clipping Machines.

Hutchins, E. S., Bridgeport, Conn.
McCoy, Jos. F. & Co., 26 Warren St.

Coal.

Sarns, C. K. & Co., Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.

Coke.

Sarns, C. K. & Co., Philadelphia, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Rainey, W. J., Cleveland, O.
Sibell, Geo. H. & Co., Chicago, Ill.
Wister, Francis, Philadelphia, Pa.

Collections.

Hardware Board of Trade (Limited), 4 and 6 Warren, N. Y.

Condensers.

Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.

Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Copper.

Ames Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 384 Pearl, N. Y.
Randolph & Clowes, Waterbury, Conn.
Wister, Francis, Philadelphia, Pa.

Coppersmiths.

Emory, P. P. Mfg. Co., Springfield, Mass.

Cordage.

Samson Cordage Works, Boston, Mass.

Cork Screws.

Williamson, C. T. Wire Novelty Co., Newark, N. J.

Corrugated Furnaces.

Continental Iron Wks, Brooklyn, N. Y.

Corrugated Iron.

Cambridge Roofing Co., Cambridge, O.
Moseley Iron Bridge & Roof Co., S. Dey, N. Y.

Counting Machines.

Durant, W. N., Milwaukee, Wis.
Osborn, G. Edw. & Co., New Haven, Ct.

Coupling.

Almond, T. R., Brooklyn, N. Y.

Coverings, Boiler and Pipe.

Johns, H. W. Mfg. Co., 87 Malden Lane

Cranes.

Detroit Foundry Equipment Co., Detroit, Mich.
Halsey, W. S. & Co., Birdsboro, Pa.
Harrington, E. Son & Co., Phila., Pa.
Maris & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Yale & Towne Mfg. Co., Stamford, Conn.

Cupolas, Hot-Blast.

Collian, Victor, Detroit, Mich.
Detroit Fdry. Equipment Co., Detroit, Mich.

Cutlery Cases.

Torrey, J. R. & Co., Worcester, Mass.

Cutlery, Importers of.

Field, Alfred & Co., 93 Chambers St., New York.
Gurney, Fred B., 116 Chambers St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.

Bingham, W. Co., Cleveland, Ohio.
Dane, Stoddard & Kendall, Boston, Mass.
Electric Cutlery Co., 118 Chambers, N. Y.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northampton, Mass.
Wilson, John, Sheffield, England.

Dampers.

Shepard, Sidney & Co., Buffalo, N. Y.

Dies.

Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.

Bliss, E. W. Co., Brooklyn, N. Y.

Dog Collars.

Chapman Mfg. Co., Meriden, Conn.

Door Checks and Springs.

Barstley, J., 149 & 151 Baxter St., W. V.
Corbin, P. & F., New Britain, Conn.

Door Latches.

Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Drawing Instruments.

Keuffel & Esser Co., 127 Fulton St., N. Y.

Drilling Machines.

Bickford Drill & Tool Co., Cin., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower and Forge Co., Lancaster, Pa.
Colburn, A. M., New Haven, Conn.
Dallett, Thos. H. & Co., Philadelphia, Pa.
Dwight Slate Machine Co., Hartford, Conn.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Norton & Jones Machine Tool Works, Plainville, Conn.
Penn. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Sibley & Ware, So. Bend, Ind.
Sigmund Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.

Drop Forgings.

Belden Mach. Co., New Haven, Conn.
Billings & Spencer Co., Hartford, Conn.
Boone, W. C. Mfg. Co., Boonton, N. J.
Eccles, Richard, Auburn, N. Y.
Merrill Bros., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.
Phila. Drop Forge Co., Philadelphia, Pa.
Scranton Forging Co., Scranton, Pa.
Spies, J. C. & Co., Worcester, Mass.
Williams, J. H. & Co., Brooklyn, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
Wyman & Gordon, Worcester, Mass.

Drop Presses.

Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.

Miner & Peck Mfg. Co., New Haven, Conn.
Stiles & Parker Press Co., Brooklyn, N. Y.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Dumb Waiters.

Storm Mfg. Co., Newark, N. J.

Dust Beaters.

Peabody & Parks, Troy, N. Y.

Dynamite.

New York Powder Co., 62 Liberty St. N. Y.

Dynos.

C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Lovell Mfg. Co., Ltd., Erie, Pa.

Edge Tools. Makers of.

Suck Bros., Millbury, Mass.
Buffalo Edge Tool Wks., Ridgway, Pa.
Plumb, Fayette R., Philadelphia, Pa.
White, L. & I. J. Co., Buffalo, N. Y.

Edging Shears.

D. He & McGuire Mfg. Co., Richmond, Ind.

Egg Beaters.

North Bros. Mfg. Co., Philadelphia

Electric Bells and Supplies.

Ostrander, W. R. & Co., 204 Fulton St., New York
Wollensak, J. F., Chicago, Ill.

Electric Dynamo Machines.

Co'bun Electric Mfg. Co., Fitchburg, Mass.

Elevators. Makers of.

Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.

Emery and Emery Wheels.

Bell, Geo. E., 86 John St., N. Y.
Grant Corundum Wheel Mfg. Co., Worcester, Mass.
N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., New York
Sturtevant Mill Co., Boston, Mass.

Enamels.

Nubian Iron Enamel Co., Cragin, Ill.

Engineers and Contractors.

Aiken Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R. Co., Pittsburgh, Pa.
McClure, Amster & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smythe, S. R. Co., Incorporated Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.

Engines. Gas.

Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer Bldg., N. Y.

Engines. Steam. Makers of.

Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Erie Engine Works, Erie, Pa.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co., Meadville, Pa.
Southark Foundry and Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.

Sweester, W. A., Brockton, Mass.

Expansion Bolts.

Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.

Faucets, Self-Measuring.

Lane Bros., Poughkeepsie, N. Y.

Faucets. Wooden. Makers of.

John Sommer's Son, Newark, N. J.

Feed-Water Heaters.

Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Wks., Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.

Fencing. Iron and Wire.

Sarnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., Elmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
Rehance Wire & Iron Wks., Milwaukee

Filles. Importers of.

Moss, F. W., 80 John, N. Y.

Filles and Raps. Manufacturers of.

Arcade File Works, Anderson, Ind.
Spaker & White, Troy, N. Y.

Barnett, G. & H., 41 & 43 Richmond Phila.
McCahey File Co., Philadelphia.
Nicholson File Co., Providence R. I.

Fire Brick. Makers of.

Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Treichler & Sons, Foot & Houston, St.
McLeod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 33d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. L. & Bro., Woodbridge.

Fire Sets.

Troy Nickel Works, Troy, N. Y.

Fishing Tackle.

Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Flue Cleaners.

Mackey, Jas. T., St. Louis, Mo.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Foreign Periodicals.

Stechert, G. E., 810 Broadway, N. Y.

Forges, Portable, &c.

Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Eastern Forge Co., Boston, Mass.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.

Foundry Facings.

S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.

Foundry Middles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

Colliau, Victor, Detroit, Mich.
Diamond Clamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.

Friction Clutches.

Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Friction Cone.

Evans Friction Cone Co., Boston, Mass.

Fruit Presses.

Enterprise Mfg. Co., Philadelphia, Pa.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas & Steam Fitters' Supplies.

Pancoast, Henry B. & Co., Phila., Pa.

Gauge, Rolling Mill.

Haines Gauge Co., Philadelphia, Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London, Conn.

Gears.

Beaton Gear Works, Boston, Mass.
Gleason Tool Co., Rochester, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glass Tubes.

Ashcroft Mfg. Co., 111 Liberty St., N. Y.

Glue.

Baeder, Adamson & Co., Phila., Pa.
Russell Cement Co., Gloucester, Mass.

Grass Catchers.

Supplee Hardware Co., Phila., Pa.

Grinding and Polishing Machines.

Norton Emery Wheel Co., Worcester, Mass.
Washburn Shops, Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stone Co., Cleveland, O.

Gunpowder. Makers of.

Lafin & Rand Powder Co., 29 Murray St., N. Y.

Hand Carts.

Lansing Wheelbarrow Co., Lansing, Mich.

Handles.

New York Mallet and Handle Wks., 456 E. Houston St., N. Y.

Haugers, Deer.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.

Hardware Comm'n Merchants.

Doscher, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Manufacturers.

Hotchkiss, E. S., Bridgeport, Conn.
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 108 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs. Agents.

Bingham, W. Co., Cleveland, O.
Clarke Thomas, St. John, New Brunswick.
Graham, John H. & Co., 113 Chambers, McCoy, Jos. F. Co., 28 Warren St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
Belden Machine Co., New Haven, Conn.
Empire Portable Forge Co., Lansingburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Haines & Zimmerman, Phila., Pa.
Hart, H. C. Mfg. Co., Detroit, Mich.
Johnson, S. C., Racine, Wis.
Kapp & Cowles Mfg. Co., Bridgeport, Conn.
New Britain Hdw. Mfg. Co., New Britain, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.
Welland, Chas., 149 Chambers St., N. Y.
Wilson, J. Fred, Worcester, Mass.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
Cover's Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.

Hay Knives.

Holt, Hiram, Co., E. Wilton, Me.

Holisting Machines.

Box, Alfred & Co., 314 Green, Phila.
Brown Holding & Conveying Mch. Co., Cleveland, Ohio.
Copeland & Bacon, 85 Liberty St., N. Y.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. & Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lignwood Mfg. Co., 36 Liberty, N. Y.
Marks & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spedel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.

Hollow Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Horse and Barbers' Clippers.

Hotchkiss, E. S., Bridgeport, Conn.

Horse Nails. Makers of.

Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.

Horse and Mule Shoes. Makers of.

Bryden Horse Shoe Co., Catsaqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Schoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.

Hose.

N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.

Ice-Cream Freezers.

Clement & Dunbar, Phila., Pa.
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.

Injectors.

Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York.

Insurance. Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, John J., Philadelphia.
Hogan, John L. & Co., Philadelphia.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Kesley, Jerome & Co., Philadelphia.
Lee, J. Tammal & Co., Philadelphia.
Mohr, J. J., 480 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Sibell, Geo. H. & Co., Chicago, Ill.
Wister, L. & R. Co., Phila., Pa.

Iron Ore.

Naylor & Co., 45 Wall, N. Y.
Fulman, J. Wesley, Phila., Pa.
Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barnes, C. K. & Co., Philadelphia, Pa.
Korden & Lovell, 70 West, N. Y.
Russening & Cunliffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Naylor & Co., 45 Wall St., N. Y.
Nicola, Wheeler & Co., Philadelphia.
Ordin & Wallace, 85 Elm St., N. Y.
Pierston & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott Wheelock & Co., N. Y. and Boston
Lundberg, Gustaf, Boston, Mass.

Iron, Sheet. Manufacturers of.

Cambridge Iron & Steel Co., Cambridge Ohio
W. Dewees Wood Co., Ltd., McKeesport, Pa.

Ironwork. Ornamental.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.

Keys.

Wollensak, J. F., Chicago, Ill.

Ladders, Rolling.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Ladies.

Detroit Fdy. Equipment Co., Detroit Mich.

Lamp Stoves.

Glazier Stove Co., Chelsea, Mich.

Lanterns.

Buhl Stamping Co., Detroit, Mich.
Steam Gauge & Lantern Co., Syracuse, N. Y.

Lathes.

Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr. & Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass

Machinery.

Am. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. B., 45 Der. St., N. Y.
Biggall & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.
Bliss, E. W. Co., Brooklyn, N. Y.
Bogert, Jno. L., Flushing, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Cinn. Milling Mch. Co., Cincinnati, Ohio.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Coulter & McKensie Mch. Co., Bridgeport, Conn.
Detroit & Harvey Mch. Co., Baltimore, Md.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Light & Canal St.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Heider, A. L., Wilmington, Del.
Reider Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists Supply Co., Rochester, N. Y.
Manville, E. J. Mch. Co., Waterbury, Conn.
Newark Mch. Tool Works, Newark, N. J.
New Haven Mfg. Co., New Haven, Conn.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Place, Geo., 120 Broadway, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Pratt & Whitney Co., Hartford, Conn.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons L. F., Philadelphia, Pa.
Stephens, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., La., Phila.
Tommer, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wickes Bros., Saginaw, Mich.
Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacturers.

Adt, Jno. & Son, New Haven, Conn.

Machine Knives.

Loring Coes & Co., Worcester, Mass.

Machine Screws.

New Britain Hdw. Mfg. Co., New Britain, Conn.

Machine Tools.—See Machinery.**Machine Work.**

Fapping, J., 58th St., & 11th Ave., N. Y. City.

Machinists' Scales.

Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
Vallentine Tool Co., Hartford, Conn.

Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.

Mallets.

N. Y. Mallet & Handle Works, N. Y.

Mangles.

Johnson, S. C., Racine, Wis.

Measuring Tapes.

Keuffel & Esser Co., 127 Fulton St., N. Y.
Lufkin Rule Co., Saginaw, Mich.

Meat Cutters and Stuffers.

Enterprise Mfg. Co., Philadelphia, Pa.

Mechanical Instruction.

Correspondence School of Mechanics
Scranton, Pa.

Metals.

Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.

Metal Brokers.

American Metal Co., N. Y.

Metallurgists.

Britton J. Blodgett, Phila.

Milling Machines.

Cin. Milling Mch. Co., Cincinnati, Ohio.

Mining Knives.

Palmer Hdw. Mfg. Co., Troy, N. Y.

Mine Lamps.

Darby, Edw. & Sons, Phila. Pa.
Leonard, B. E., Scranton, Pa.

Mining Screens.

Harrington & King Perforating Co.
Chicago, Ill.
Howard & Morse, 45 Fulton, N. Y.

Models, Makers of.

Franklin, H. H. Mfg. Co., Syracuse, N. Y.

Molding Sand.

Obermayer, S. Co., Cincinnati, O.

Motors, Water and Electric.

O. & C. Electric Co., 402 and 404
Greenwich St., N. Y.
Dallett, Thos. H. & Co., Phila., Pa.

Nail Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nails (Out) and Spikes.

Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.
Oxford Iron Co., 81 Washington
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks., Wheeling, W. Va.

Nickel Platers' Supplies.

Colburn Electric Mfg. Co., Fitchburg, Mass.

Norway Shapes, Rollers of.

Rowland, William & Harvey, Fawcett, Philadelphia

Novelty Manufacturers.

Franklin, H. H. Mfg., Syracuse, N. Y.

Nut Machines.

Onham Nut Mch. Co., Unionville, O.

Nuts, Bolts, &c., Makers of.

American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Haskell, Wm. H. Co., Pawtucket, R. I.
Mc Carmel Bolt Co., Mt. Carmel, Conn.
Port Chester Bolt and Nut Co., Chester, N. Y.
Russell, Burdall & Ward, Port Chester
Sternbergh, J. B. & Son, Reading, Pa.
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.

Oilers.

Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.

Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

Oil Stoves.

Poster Stove Co., Ironton, O.
Glazier Stove Co., Chelsea, Mich.

Ores.

Wister, Francis, Philadelphia, Pa.

Pl. Shoes.

Scranton Forging Co., Scranton, Pa.

Packing.

Morrison, Robt., St. Louis, Mo.
N. Y. Belting & Packing Co. Ltd., N. Y.

Padlocks.

Ames Sword Co., Chicopee, Mass.
Fraim, E. T., Lancaster, Pa.
Hillebrand & Wolf, Phila., Pa.
Miller Lock Co., Philadelphia, Pa.

Paint.

Dixon, Jos. Cradible Co., Jersey City, N. J.

Paint Burners.

Dangler Stove & Mfg. Co., Cleveland, O.

Paint Cans.

Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.

Pants Stretcher.

Covert Mfg. Co., West Troy, N. Y.

Patent Solicitors.

Howson & Howson, Phila. & Wash'ton.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.
Kingston & King Perforating Co., Chicago, Ill.
Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Phosphor Bronze.

Phosphor Bronze Smelting Co., Limited, 513 Arch, Philadelphia.

Phosphor Tin.

Crescent Phosphorized Metal Co., Philadelphia, Pa.
Halk & Naumann, 516 Pearl, N. Y.

Picks and Mattocks.

Slumb, Fayette R., Philadelphia, Pa.

Pig Iron.

Houston, C. B. & Co., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Rayor & Co., 45 Wall, N. Y.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.

Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

Pile Drivers.

Vulcan Iron Wks., Chicago, Ill.

Pipe Bent.

National Pipe Bending Co., New Haven

Pipe Cutting and Threading Machines.

Signal & Keeler Mfg. Co., St. Louis, Mo.
Merrill Mfg. Co., Toledo, O.
Pancoat Henry B. & Co., Philadelphia.
Saunders Sons, D., Yonkers, N. Y.

Pipe Grips.

Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, &c., Makers of.

McNab & Harlin Mfg. Co., N. Y.

Pipe, Water and Gas, Makers of.

Cumberland Nail & Iron Co., Phila., Pa.
Donaldson Iron Co., Emaus, Pa.
Riverside Iron Works, Wheeling, W. Va.
Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons, Manufacturers of.

Buck Bros., Millbury, Mass.

Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

Plated Ware.

Warman L. & Son New Haddam, Ct.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, Wm. Mfg. Co., Hartford, Ct.

Plate, Iron and Steel, Mfrs of.

Atlas-Standard Iron & Steel Co., Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.

Mahoning Valley Iron Co., Youngstown, Ohio.

Moorhead-McLean Co., Pittsburgh, Pa.
Mollavin & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Wellman Iron & Steel Co., Thurlow, Pa.
Woodman Co., Philadelphia.

Plating, Nickel, Brass and Silver.

Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.

Pokers and Lifters.

Troy Nickel Works, Troy, N. Y.

Polishing Machines.

Watson & Stillman, 204 E. 43d, N. Y.

Post Hole Diggers.

Gibbs Mfg. Co., Canton, Ohio.
Wister, L. & Co., Philadelphia, Pa.

Poultry Nettings.

Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
"Silver Finish."
Tyler Wire Wks. Co., W. S., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Powder.

Lafin & Rand Powder Co., 29 Murray
New York Powder Co., 62 Liberty St., N. Y.

Power Hack Saws.

Millers Falls Co., 93 Reade St., N. Y.

Pewer Hammers.

Selden Mach. Co., New Haven, Conn.
Dienelt & Eisenhardt, Philadelphia.
Jenkins & Linke, Bellefonte, Pa.
Long & Allstatter Co., Hamilton, Ohio.

Presses, Dies, &c.

E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Stecher Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Mch. Co., Waterbury, Conn.

Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct.
Merriman, A. H., Meriden.
Stark Mch. & Tool Co., Buffalo, N. Y.
Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.

Pulleys.

Keystone Clutch Mch. Wks., Phila., Pa.
Lace, J. H. & D. Co., Massillon, Ohio.

Pumping Machinery.

Dean Bros. Steam Pump Works, Indianapolis, Ind.
Hooker-Cultrix Steam Pump Co., Chicago, Ill.
McGowan, J. H. & Co., Cincinnati, O.
Maalin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk, Conn.
Southwark Fdy. & Mch. Co., Phila., Pa.
Valley Pump Wks., Easthampton, Mass.
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Pumps, Makers of.

Bellevue Pump Co., Bellevue, Iowa.
Deming Co., Salem, O.
Hooker-Cultrix Steam Pump Co., Chicago, Ill.
Douglas, W. & B., Middletown, Conn.
Maas, Foss & Co., Springfield, O.
Myers, F. E. & Bro., Ashland, O.

Punches and Shears, Hand and Power.

E. W. Bliss Co., Brooklyn, N. Y.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Crosby, G. A. & Co., Chicago, Ill.
Heider, A. L., Wilmington, Del.
Long & Allstatter Co., Hamilton, Ohio.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.

Perry, W. H. & Co., Providence, R. I.

Rat and Mouse Traps.

Burditt & Williams, Boston, Mass.
Estey, W. S., 65 Fulton, N. Y.
Ripley Mfg. Co., Unionville, Conn.

Razors.

Electric Cutlery Co., 113 Chambers, N. Y.
J. R. Torrey Razor Co., Worcester, Mass.

Reels.

Hendryx, A. B. Co., New Haven, Conn.

Refrigerator Door Fasteners.

Conroy, P. J. & Co., Philadelphia.

Rivets.

Blake & Johnson, Waterbury, Conn.
Boyce Rivet Co., Muncie, Ind.
Burden Iron Co., Tr. J., N. Y.
Blak & Drew, Plymouth, Mass.
Sternbergh, J. B. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton, Pa.

Riveting Machines.

Adt, Jno. & Sons, New Haven, Conn.

Rock Drills.

Sand Drill Co., 23 Park Place, N. Y.

Rolling Mill Machinery.

Birmingham Iron Fdry, Birmingham, Conn.
Booth, The Lloyd, Co., Youngstown, O.
Leachbury Foundry & Mch. Co., Pittsburgh, Pa.
Mahoning Fdry & Mch. Co., Danville, Pa.
Morgan Construction Co., Worcester, Mass.

Robinson-Rea Mfg. Co., Pittsburgh.

Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

Tretlowey Mfg. Co., Pittsburgh, Pa.

Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

Roll Lathes.

Totten & Hogg Iron & Steel Fdry Co., Pittsburgh, Pa.

Rolls, Chilled, Sand and Steel.

Booth, The Lloyd, Co., Youngstown, O.
Garrison, A. Fdry, Co., Pittsburgh, Pa.
Seaman, Sleeth & Black, Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

Roofing.

Berlin Iron Bridge Co., E. Berlin, Conn.
Boston Bridge Works, Boston, Mass.
Cambridge Roofing Co., Cambridge, O.
Johns, H. W. Mfg. Co., 87 Maiden Lane

Rope and Web Goods.

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.

Rope Wheels.

Cresson, Geo. V. Co., Philadelphia, Pa.

Rubber Goods.

Canfield, H. O., Bridgeport, Conn.

Rules, Manufacturers of.

Keuffel & Esser Co., 127 Fulton St., N. Y.
Lufkin Rule Co., Saginaw, Mich.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers.

Rust Preventive.

Bridgeport Gun implement Co., 813-815 Broadway, N. Y.

Sad Irons.

Enterprise Mfg. Co., Philadelphia, Pa.

Sand Paper.

Baeder, Adamson & Co., Phila., Pa.

Sash Balances.

Fulman Sash Balance Co., Rochester, N. Y.
Vanderbilt Sash Balance Co., Canandaigua, N. Y.

Sash Cords and Chains.

Morton, Thos., 65 Elizabeth, N. Y.
Ossawan Mills Co., Norwalk, Conn.
Samson Cordage Works, Boston, Mass.
Smith & Egge, Mfg. Co., Bridgeport,

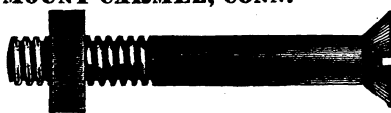
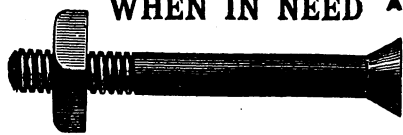
- Allentown Rolling Mill.** Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passalo Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.
- Shears and Scissors.**
Aeme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
Atina-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Chess Bros., Pittsburgh, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Moorehead-McCleane Co., Pittsburgh, Pa.
Pleerson & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Metal Work.**
Clark & Cowles, Plainville, Conn.
- Sheet Zinc.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Koch, A. B. & Co., Peoria, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skates, Ice.**
Dame, Stoddard & Kendall, Boston, Mass.
Lovell, Jno. P. Arms Co., Boston, Mass.
Sickels, Sweet & Lyon, 35 Barclay St., N. Y.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Hentley, M. C., Richmond, Ind.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Glenden Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.
- Specialties, Pat. Articles.**
Konigslow, O., Cleveland, O.
Rhodes, L. E. Co., Hartford, Conn.
- Spelter.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.**
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**
Hartley & Graham, 313-315 B'way, N. Y.
- Springs.**
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Tuck Mfg. Co., Brockton, Mass.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**
Pullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Co., 14 Warren St., N. Y.
- Stamped Ware.**
Am. Stamping Co., 104 & 106 John St., New York.
- Stamping Works.**
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
Bristols Mfg. Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**
Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburgh, Pa.
- Steam Heating.**
Webster Warren & Co., Camden, N. J.
- Steam Separators.**
Gouvert Mfg. Co., 32 Cortland St. N. Y.
Harrison Safety Boiler Wks., Phila. Pa.
- Steel, Cold Rolled Strip.**
Wilmut & Hobbs Mfg. Co., Bridgeport Conn.
- Steel Figures and Alphabets.**
Hoeng, C. W., 52 Fulton St., N. Y.
McCarud, W., 81 Fulton, N. Y.
Wolf, C. H., 177 William St., N. Y.
- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, Eng. land, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
Atina-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Herman & Co., 103 Duane St. Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Eiken & Co., Hagen, Germany.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, Eng. land, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng. La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorehead-McCleane Co., Pittsburgh, Pa.
Moss, F. W., 83 John, N. Y.
Naylor & Co., 45 Wall, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Rowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Stanley Works, New Britain, Conn.
Steel & Iron Improvement Co., Pittsburgh, Pa.
Taylor Iron & Steel Co., High Bridge, N. J.
Wordlaw, S. & C., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmut & Hobbs Mfg. Co., Bridgeport Conn.
- Steel, Manufacturers' Agents.**
Barnes, C. K. & Co., Philadelphia, Pa.
Corning, Edw. & Co., 28 B'way, N. Y.
Frasse Co., 19 Warren St., New York.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, Eng. land, or 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders.**
Bicycle Step Ladder Co., Chicago, Ill.
Croissant, M., Albany, N. Y.
- Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Saunders Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Linings.**
Ostrander Fire Brick Co., Troy, N. Y.
- Stone Pipe Thimbles.**
Cheney, S. & Son Manlius, N. Y.
- Stone Trimmings.**
Troy Nickel Works, Troy, N. Y.
- Street Lamps.**
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Strops.**
Electric Cutlery Co., 113 Chambers, N. Y.
J. R. Torrey & Co., Worcester, Mass.
- Structural Iron Work.**
Berlin Iron Bridge Co., East Berlin, Conn.
Boston Bridge Wks., Boston, Mass.
Lindsay, Jas. G. & Co., Phila., Pa.
Wrought Iron Bridge Co., Canton, O.
- Sulphuric Acid.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**
Atlas Tack Corporation, Boston, Mass.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
- Taps and Dies.**
Fatterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
Riehle Bros. Testing Mch. Co., Philadelphia.
- Testing Machines.**
Riehle Bros. Testing Mch. Co., Phila.
- Theatrical Hardware.**
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**
Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.
- Time Record.**
Scattergood, H. W., Phila., Pa.
- Tinners' Hardware.**
Berger Bros., Philadelphia, Pa.
- Tinning Process.**
Sands, Thomas, Nashua, N. H.
- Tin Plate Machinery.**
Lloyd Booth Co., Youngtown, Ohio.
- Tinware.**
Am. Stamping Co., 104 & 106 John St., New York.
- Tire Upsetters.**
Butts & Ordway, Boston, Mass.
- Toe Calks, Steel.**
Burke, P. F., Boston, Mass.
- Tool Chests.**
Am. Tool Co., 200 W. Houston St., N. Y.
- Tools.**
Fraser, R. H. & Co., New Haven, Conn.
Frasse Co., 19 Warren St., New York.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 93 Reade, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, Street, L. S., Athol, Mass.
- Tools, Blacksmith and Wheelwrights.**
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**
Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasolene.**
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
- Transom Lifters.**
Wollensak, J. F., Chicago, Ill.
- Trucks, Manufacturers of.**
Berger Bros., Philadelphia, Pa.
Clark, G. P., Windsor Locks, Conn.
Lansing Wheelbarrow Co., Lansing, Mich.
- Tubes, Seamless Drawn Copper.**
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**
Ellwood Shaffling & Tube Co., Ellwood City, Pa.
Leng's John S. Son & Co., 4 Fletcher St., New York.
U. S. Projectile Co., Brooklyn, N. Y.
- Tumbling Barrels.**
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
Cleveland Twist Drill Co., Cleveland.
Chase Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**
Best, Fox & Co., Pittsburgh, Pa.
Chapman Valve Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
McNab & Harlin Mfg. Co., 56 Jussu, N. Y.
Mason Regulator Co., Boston, Mass.
- Ventilator Appliances.**
Howard & Morse, 45 Fulton, N. Y.
- Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.
- Vises.**
Capital Mch. Tool Co., Auburn, N. Y.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Millers Falls Co., 93 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay, N. Y.
Van Wagoner & Williams Co., 14 Warren St., N. Y.
- Wagon Jacks.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
- Washers.**
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.
- Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
Peole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**
Amer. Steel Scraper Co., Sidney, Ohio.
- Cookburn Barrow & Mch. Co.,** Jersey City, N. J.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.
Sidney Steel Scraper Co., Sidney, O.
Sweatt Mfg. Co., Minneapolis, Minn.
- Window Cord, Makers of.**
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Prentiss, Geo. W. & Co., Holyoke, Mass.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 93 Liberty St., N. Y.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Reliance Wire & Iron Wks., Milwaukee, Wis.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.
- Wire Cutters.**
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John, N. Y.
- Wire Fences.—See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow-Saylor Wire Co., St. Louis.
Ossawan Mills Co., Norwich, Conn.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, C. T. Wire Novelty Co., Newark, N. J.
- Wire Machinery.**
Am. Tool Wks., Cleveland, O.
Manville, E. J. Mch. Co., Waterbury, Ct.
Morgan Construction Co., Worcester, Mass.
Waterbury Mch. Co., Waterbury, Conn.
- Wire Straightening and Cutting Machinery.**
Adt, John & Son, New Haven, Conn.
- Wire Nails.**
Bond Nail Co., Raynham, Mass.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Phillips, Townsend & Co., Phila., Pa.
Salem Wire Nail Co., Salem, O.
Whitney, A. R. & Co., New York City.
- Wire Rops, Steel.**
New Castle Wire Nail Co., New Castle, Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel Makers.**
Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco.
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschke & Son, Rope Co., St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
Williamsport Wire Rope Co., Williamsport, Pa.
- Wood-Working Machinery.**
Fay, J. A. & Egan Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Wrenches, Manufacturers of.**
Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn.
Coxs Wrench Co., Worcester, Mass.
Keystone Mfg. Co., Buffalo, N. Y.
Trinmont Mfg. Co., Roxbury, Mass.
Williams, J. H., Brooklyn, N. Y.
- Wringers.**
Colby Wringer Co., Montpelier.

ALPHABETICAL INDEX TO ADVERTISERS.

Abbott, Wheelock & Co.....	17	Buffalo Forge Co.....	98	Cumberland Nail & Iron Co.....	16	Haines Gauge Co.....	2
Acme Shear Co.....	65	Buffalo Scale Co.....	84	Cushman Chuck Co.....	42	Halk & Naumann.....	3
Adt, John & Son.....	48	Buffalo Edge Tool Works.....	64	Dallett, Thos. H. & Co.....	46	Halsey, Jas. T.....	42
Aetna-Standard Iron & Steel Co.....	19	Buffalo Specialty Mfg. Co.....	65	Dame, Stoddard & Kendall.....	70	Halsey, W. S. & Co.....	24
Aiken, Henry.....	26	Buhl Stamping Co.....	74	Dangler Stove & Mfg. Co.....	75	Hamilton Machine Tool Co.....	34
Alexander Bros.....	34	Bullock Bellows Co.....	38	Darby, Edw. & Sons.....	8	Hammer & Co.....	84
Allentown Rolling Mills.....	27	Burden Iron Co.....	81	Davis & Cook.....	56	Hardware Board of Trade.....	51
Almond, T. R.....	37	Burditt & Williams.....	74	Davis, I. B. & Son.....	32	Harrington, E., Son & Co.....	45
Am. Bolt Co.....	89	Burgess & Loxley.....	98	Davol, John & Sons.....	2	Harrington & King Perforating Co.....	13
Am. Metal Co.....	3	Burke, P. F.....	33	Dayton Malleable Iron Co.....	98	Harrison Safety Boiler Wks.....	31
Am. Pig Iron & Storage Warrant Co.....	19	Burr & Houston Co.....	25	Dean Eros. Steam Pump Works.....	33	Hart, Henry C. Mfg. Co.....	71
Am. Screw Co.....	12	Bussenius & Cunliffe.....	49	Deitz, A. E.....	85	Hart Mfg. Co.....	46
Am. Stamping Co.....	74	Butterfield & Co.....	42	Deming Co.....	58	Hartford Steam Boiler Insp. and Ins. Co.....	30
Am. Steel Scraper Co.....	86	Butts & Ordway.....	41	Detrick & Harvey Machine Co.....	45	Hartley & Graham.....	1
Am. Tool Co.....	73	C. & C. Electric Co.....	28	Detroit Foundry Equipment Co.....	23	Haskell, Wm. H. Co.....	90
American Tool Works.....	49	California Wire Works.....	5	Diamond Clamp & Flask Co.....	98	Hazard Mfg. Co.....	8
Ames Sword Co.....	77	Cambria Iron Co.....	18	Diamond State Iron Co.....	81	Heinisch's R. Sons Co.....	65
Ansonia Brass & Copper Co.....	2	Cambridge Iron & Steel Co.....	23	Dienelt & Eisenhardt.....	39	Henderer, A. L.....	39
Arcade File Works.....	62	Cambridge Roofing Co.....	14	Dille & McGuire Mfg. Co.....	88	Henderson Bros.....	24
Arcade Malleable Iron Co.....	22	Canfield, H. O.....	25	Disston, Henry & Sons.....	61	Hendey Machine Co.....	54
Armstrong Mfg. Co.....	38	Capewell Horse Nail Co.....	52	Dixon, Jos., Crucible Co.....	35	Hendricks Bros.....	2
Artificial Gas Engineering Co.....	27	Capital Machine Tool Co.....	58	Donaldson Iron Co.....	25	Hendrick Mfg. Co., Ltd.....	7
Ashcroft Mfg. Co.....	32	Carbon Steel Co.....	19	Doscher, Martin.....	65	Hendryx, A. B. Co.....	3
Atlas Mfg. Co.....	78	Carlin's Sons, Thomas.....	49	Douglas, W. & B.....	58	Henley, M. C.....	72&88
Atlas Tack Corporation.....	10	Carpenter, J. M. Tap & Die Co.....	97	Draper Machine Tool Co.....	49	Herrick, J. A.....	26
Babcock & Wilcox Co.....	29	Chadborne & Coldwell Mfg. Co.....	38	Dudgeon, Richard.....	40	Hiertz, T. & Son.....	4
Raeder, Adamson & Co.....	56	Chambers Bros. Co.....	30	Durbar Bros.....	5	Hillebrand & Wolf.....	36
Banker & White.....	63	Champion Blower & Forge Co.....	42	Dunham Nut Machine Co.....	40	Hill, Clarke & Co.....	50
Bardsley, J.....	84	Champion Iron Co.....	7	Durant, W. N.....	33	Hobson, F., Seaman & Co.....	17
Barns, C. K. & Co.....	20	Chapman Mfg. Co.....	98	Dwight Slate Machine Co.....	38	Hoefig, C. W.....	72
Barnes, W. F. & John.....	37	Chapman Valve Mfg. Co.....	31	Eagle Bicycle Mfg. Co.....	97	Hoffman, C. & A.....	64
Barnett, G. & H.....	63	Chatillon, John & Sons.....	74	Eastern Forge Co.....	13	Hoffman, J. W. & Co.....	16
Barnum, E. T.....	11	Cheney, S. & Son.....	22	Eccles, Richard.....	79	Hogan, John L. & Co.....	16
Bass Foundry & Machine Works.....	31	Chess Bros.....	22	Edge Moor Iron Co.....	25	Hollands Mfg. Co.....	61
Belden Machine Co.....	37	Chester Steel Casting Co.....	24	Eicken & Co.....	18	Holmes & Edwards Silver Co.....	59
Bell, Geo. E.....	47	Chrome Steel Works.....	23	Electric Cutlery Co.....	66	Holt, Hiram & Co.....	89
Bellevue Pump Co.....	59	Church, Isaac.....	90	Ellwood Shafting & Tube Co.....	19	Hooker-Colville Steam Pump Co.....	49
Bement, Miles & Co.....	39	Cincinnati Milling Mch. Co.....	47	Emory, P. P. Mfg. Co.....	13	Hotchkiss, E. S.....	73
Bemis & Call Hardware & Tool Co.....	84	Clinical Mfg. Co.....	35	Empire Portable Forge Co.....	85	Houston, C. B. & Co.....	13
Berger Bros.....	59	Clapp, Geo. M.....	50	Enterprise Mfg. Co. of Pa.....	75	Howard Iron Works.....	63
Berlin Iron Bridge Co.....	9	Clark, G. P.....	33	Erie Engine Works.....	32	Howard & Morse.....	7
Best, Fox & Co.....	3	Clark & Cowles.....	6	Estey, W. S.....	6	Howson & Howson.....	6
Bethlehem Iron Co.....	20	Clarke, Thomas.....	74	Ette & Henger Mfg. Co.....	57	Ideal Mfg. Co.....	71
Bevin Bros. Mfg. Co.....	71	Clement & Dunbar.....	57	Etting, Edw. J.....	16	Illinois Pure Aluminum Co.....	74
Bickford Drill & Tool Co.....	44	Clendenin Bros.....	11	Eureka Cast Steel Co.....	98	Indiana Wire Fence Co.....	7
Bicycle Step Ladder Co.....	72	Cleveland Block Co.....	78	Evans-Friction Cone Co.....	3	Ives, H. B. & Co.....	84
Bigelow, C. R.....	50	Cleveland City Forge & Iron Co.....	1	Eynon-Evans Mfg. Co.....	30	Jacobus, W. H.....	90
Biggall & Keeler Mfg. Co.....	41	Cleveland Stamping & Tool Co.....	72	F. & N. Mfg. Co.....	88	Jarecki Mfg. Co.....	38
Billings & Spencer Co.....	84	Cleveland Stone Co.....	57	Fairmount Machine Co.....	45	Jeffrey Mfg. Co.....	34
Bingham, W. Co.....	66	Cleveland Twist Drill Co.....	46	Fay, J. A. & Egan Co.....	44	Jenkins Bros.....	1
Birmingham Iron Foundry.....	22	Clinton Wire Cloth Co.....	8	Fearing, Wm. S.....	2	Jenkins & Lingle.....	37
Bissell, E. Son & Co.....	51	Cobb & Drew.....	6	Field, Alfred & Co.....	64	Jenner, H. W. T.....	6
Blake & Johnson.....	11	Coburn Trolley Track Mfg. Co.....	76	Fitch, W. & E. T.....	97	Jessop, Wm. & Sons.....	17
Bliss Co., E. W.....	36	Cockburn Barrow & Machine Co.....	86	Fitchburg Machine Works.....	39	Johns, H. W. Mfg. Co.....	14
Boardman, L. & Son.....	72	Coes, Loring & Co.....	85	Fitzsimons & Co.....	16	Johnson, I. G. & Co.....	98
Bogert, John L.....	47	Coes Wrench Co.....	85	Flagg, Stanley G. & Co.....	98	Johnson, I. H., Jr., & Co.....	44
Boker, Hermann & Co.....	17	Coffin & Leighton.....	38	Forehand Arms Co.....	70	Johnson, S. C.....	83
Bond Nail Co.....	53	Colburn, A. M.....	42	Foster Stove Co.....	68	Jones, B. M. & Co.....	20
Boone, W. C. Mfg. Co.....	24	Colburn Electric Mfg. Co.....	28	Fraim, E. T.....	77	Jones & Lamson Machine Co.....	54
Booth, The Lloyd Co.....	25	Colby Wringer Co.....	77	Frankford Steel Co.....	18	Kayser, Ellison & Co.....	17
Borden & Lovell.....	11	Coldwell Lawn Mower Co.....	87	Franklin, H. H. Mfg. Co.....	51	Keeley, Jerome & Co.....	16
Borgner, Cyrus.....	25	Colliau, Victor.....	27	Frasse Co.....	23	Kennedy, Julian.....	26
Boston Bridge Works.....	14	Conroy, P. J. & Co.....	89	Frost Thill Spring Co.....	79	Keuffel & Esser Co.....	59
Boston Gear Works.....	33	Continental Iron Works.....	31	Fulton Iron & Engine Works.....	44	Keyless Lock Co.....	77
Box, Alfred & Co.....	43	Copeland & Bacon.....	38	Gardner, Jas. & Son.....	24	Keys, W. W. & R. M. Co.....	3
Boyce Rivet Co.....	98	Corbin, P. & F.....	76	Garrison, A., Foundry Co.....	22	Keystone Clutch & Machine Works.....	42
Bradlee & Co.....	15	Corning, Edw. & Co.....	15	Garland Foundry Co.....	24	Keystone Mfg. Co.....	57
Brass Goods Mfg. Co.....	2	Correspondence School of Mechanics.....	97	Garvin Machine Co.....	50	Kilbourne & Jacobs Mfg. Co.....	86
Bridgeport Chain Co.....	66	Cotton, Barclay W. & Co.....	15	Gautier Steel Department.....	14	Kilmer Mfg. Co.....	7
Bridgeport De-oxidized Bronze & Metal Co.....	2	Coulter & McKenzie Machine Co.....	38	Gaylord, F. L. Co.....	3	Kling, J. M. & Co.....	63
Bridgeport Gun Implement Co.....	71	Covert Mfg. Co.....	79	Gibbs Mfg. Co.....	87	Knapp & Cowles Mfg. Co.....	63
Briggs, Marvin.....	50	Covert's Saddlery Works.....	55	Gilbert & Bennett Mfg. Co.....	8	Koch, A. B. & Co.....	64
Bristols' Mfg. Co.....	1	Cox, Justice, Jr.....	16	Gleason Stove Co.....	55	Kohler, F. E. & Co.....	88
Britton, J. Blodgett.....	27	Cramp, Wm. & Sons S. & E. B. Co.....	3	Gleason Tool Co.....	28	Konigsloew, Otto.....	57
Broderick & Bascom Rope Co.....	6	Crescent Horse Shoe & Iron Co.....	83	Goodell Co.....	68	Kreischer, B. & Sons.....	24
Bronson Supply Co.....	74	Crescent Phosphorized Metal Co.....	3	Goubert Mfg. Co.....	29	Krogsrud, W.....	72
Brown, E. E. & Co.....	79	Crescent Steel Co.....	19	Gould & Eberhardt.....	35	La Belle Steel Co.....	21
Brown Hoisting & Conveying Mch. Co.....	34	Cresson, Geo. V. Co.....	41	Graham, John H. & Co.....	73	Lafin & Rand Powder Co.....	22
Brown, R. H. & Co.....	56	Croissant, M.....	78	Grand Crossing Tack Co.....	10	Lake, J. H. & D. Co.....	43
Bryden Horse Shoe Co.....	81	Crosby, G. A. & Co.....	34	Grant Corundum Wheel Mfg. Co.....	47	Lane Brothers.....	77
Buck Bros.....	65	Crown Smelting Co.....	3	Green, A. H.....	87	Lansing Wheelbarrow Co.....	86
Buckeye Engine Co.....	31			Gurney, F. B.....	65	Laughlin, Alex. & Co.....	26
				Haight & Clark.....	25		
				Haines & Zimmermann.....	71		

Lea, J. Tatnall & Co.....	21	New Haven Wire Mfg. Co.....	6	Riehle Bros. Testing Machine Co.....	36	Taintor Mfg. Co.....	60
Lean, D. R. Co.....	27	N. J. Wire Cloth Co.....	8	Ripley Mfg. Co.....	68	Tablet & Ticket Co.....	47
Le Count, C. W.....	81	New Process Twist Drill Co.....	46	Riverside Iron Works.....	23	Talcott, W. O.....	35
Leechburg Foundry & Machine Co.....	23	Newton & Shipman.....	17	Roberts, A. & P. & Co.....	18	Taylor Iron & Steel Co.....	23
Leng's, Jno. S. Son & Co.....	98	N. Y. Belting & Packing Co.....	35	Roberts, Frank C. & Co.....	26	Thomson, W. H. & Co.....	16
Leonard, B. E.....	85	N. Y. Mallet & Handle Works.....	64	Roberts Mfg. Co.....	34	Tiebout, W. & J.....	78
Leonard, J.....	20	N. Y. Powder Co.....	22	Robinson-Rea Mfg. Co.....	24	Titchener, E. H. & Co.....	7
Leschen, A. & Sons Rope Co.....	6	Nicholson File Co.....	63	Rogers, The Wm. Mfg. Co.....	67	Tod, Wm. & Co.....	31
Levis, Henry & Co.....	20	Nicolls, Wheeler & Co.....	15	Rollason Gas Engines.....	32	Toomey, Frank.....	60
Lidgerwood Mfg. Co.....	98	Niles Tool Works.....	50	Rowland, Wm. & Harvey.....	98	Torrey, J. R. Razor Co.....	65
Lindsay, Jas. G. & Co.....	16	North Bros. Mfg. Co.....	16 & 55	Russell, Burdsall & Ward.....	98	Totten & Hogg Iron and Steel Fdry.	
Link-Belt Engineering Co.....	37	Northampton Cutlery Co.....	66	Russia Cement Co.....	57	Co.....	22
Lockhart Iron & Steel Co.....	21	Northampton Emery Wheel Co.....	47	Sabin Machine Co.....	4	Townsend, W. P. & Co.....	90
Long & Allstatter Co.....	34	Norton Emery Wheel Co.....	47	Salem Wire Nail Co.....	11	Trenton Iron Co.....	4
Lovell, Jno. P. Arms Co.....	71	Norton & Jones Machine Tool Works.....	34	Samson Cordage Works.....	1	Threthewey Mfg. Co.....	26
Lovell Mfg. Co., Ltd.....	53	Norwalk Iron Works Co.....	33	Samuel, Frank.....	15	Trimont Mfg. Co.....	34
Lovell, Tracy & Co.....	83	Nubian Iron Enamel Co.....	30	Sands, Thomas.....	48	Troy Nickel Works.....	65
Lovegrove & Co.....	50	Obermayer, S. Co.....	19	Saunders's Sons, D.....	40	Tuck Mfg. Co.....	11
Ludlow-Saylor Wire Co.....	7	Ogden & Wallace.....	20	Scattergood, H. W.....	53	Tudor Iron Works.....	1
Lufkin Rule Co.....	59	Old Dominion Iron & Nail Works Co.....	83	Schaeffer & Co.....	87	Tyler Wire Works Co. W. S.....	64
Lukens Iron & Steel Co.....	15	Osborn, G. Edw. & Co.....	33	Scheeler & Sons.....	6	Union Mfg. Co.....	43
Lundberg, Gustaf.....	17	Ossawan Mills Co.....	97	Schneider & Trenkamp Co.....	75	Union Metallic Cartridge Co.....	1
McCabe, J. J.....	49	Ostrander Fire Brick Co.....	21	Scott, Geo. M.....	39	U. S. Projectile Co.....	40
McCaffrey File Co.....	63	Ostrander, W. R. & Co.....	56	Scoville Mfg. Co.....	2	Valentine, M. D. & Bro.....	25
McClure, Amsler & Co.....	26	Otto Gas Engine Works.....	28	Scranton Forging Co.....	81	Vallentine Tool Co.....	37
McCoy, Jos. F. & Co.....	60	Oxford Iron & Nail Co.....	11	Scranton Supply & Machine Co.....	49	Valley Pump Works.....	33
McFarland, Wm.....	4	Packer, C. W.....	55	Seaman, Sleeth & Black.....	22	Van Dorn Iron Works Co.....	7
McGowan, J. H. & Co.....	33	Palmer's De Mooy.....	24	Sellers, Wm. & Co.....	45	Vanderbilt Sash Balance Co.....	77
McIlvain, Wm. & Sons.....	27	Palmer Hardware Mfg. Co.....	56	Seneca Falls Mfg. Co.....	44	Van Wagoner & Williams Co.....	98
McKay, Jas. & Co.....	16	Pancoat Henry B. & Co.....	41	Sessions Foundry Co.....	24	Victor Mfg. Co.....	78
McKinney Mfg. Co.....	76	Passaic Rolling Mill Co.....	20	Seyfert's Sons, L. F.....	49	Vulcan Iron Works.....	22
McLean, John.....	32	Peabody & Parks.....	60	Shepard, Sidney & Co.....	75	Wallace Wm. H. & Co.....	20
McLeod & Henry Co.....	24	Peck, A. G. & Co.....	93	Shoenberger & Co.....	80	Wardlow, S. & C.....	17
McNab & Harlin Mfg. Co.....	31	Peerless Mfg. Co.....	98	Shultz Belting Co.....	1	Washburn & Moen Mfg. Co.....	4
Machinists' Supply Co.....	50	Penna. Diamond Drill & Mfg. Co.....	34	Sibell, Geo. H. & Co.....	50	Washburn Shops.....	39
Mackey, James T.....	32	Pennsylvania Mch. Co.....	49	Sibley & Ware.....	48	Waterbury Brass Co.....	2
Mahoning Foundry & Machine Shop.....	23	Perry, W. H. & Co.....	49	Sickels, Sweet & Lyon.....	71	Waterbury Farrel Foundry & Ma-	
Mahoning Valley Iron Co.....	20	Philadelphia Drop Forge Co.....	25	Sidney Steel Scraper Co.....	37	chine Co.....	33
Main Belting Co.....	35	Philadelphia Engineering Wks.....	27	Sigourney Tool Co.....	38	Waterbury Machine Co.....	41
Manning, Maxwell & Moore.....	46	Phillips, Townsend & Co.....	11	"Silver Finish".....	5	Watson & Stillman.....	40
Manville Machine Co., E. J.....	48	Phoenix Horseshoe Co.....	81	Silver Mfg. Co.....	48	Webster, Warren & Co.....	28
Mansfield, H. H.....	50	Phoenix Iron Co.....	15	Simonds Mfg. Co.....	60	Welland, Chas.....	51
Maris & Beekley.....	45	Phoenix Iron Works Co.....	32	Singer, Nimick & Co.....	21	Wellman Iron & Steel Co.....	15
Maslin, J. & Son.....	33	Phosphor Bronze Smelting Co.....	3	Smith & Egge Mfg. Co.....	41	Wells Bros. & Co.....	42
Mason Regulator Co.....	97	Pierson & Co.....	19	Smith, H. D. & Co.....	83	Western Wheel Works.....	71
Mast, Foos & Co.....	59	Pike Mfg. Co.....	58	Smith, J. D. Foundry Supply Co.....	24	Wetherell Bros.....	17
Matthiessen & Hegeler Zinc Co.....	2	Pilling & Crane.....	16	Smythe, S. R. Co., Inc.....	26	Wetherhill, Robt. & Co.....	97
Maurer, H. & Son.....	24	Pittsburgh I. & S. Eng. Co.....	27	Sommer's Son, John.....	98	White, A. A. & Co.....	72
Mayhew, H. H. Co.....	71	Pittsburgh Mfg. Co.....	39	Southwark Foundry & Machine Co.....	32	White, L. & I. J. Co.....	65
Merrill Bros.....	16	Pittsburgh Reduction Co.....	54	Speidel, J. G.....	45	White Mt. Freezer Co.....	55
Merrill Mfg. Co.....	40	Place, Geo.....	49	Speirs, J. C. & Co.....	22	Whitlock Coil Pipe Co.....	30
Merriman, A. H.....	41	Plumb, Fayette R.....	66	Spencer's I. S. Sons.....	25	Whitney, A. R. & Co.....	19
Miles, F. S.....	4	Plume & Atwood Mfg. Co.....	2	Standard Fdry. & Mfg. Co.....	20	Whitney, A. & Sons.....	20
Miller & Van Winkle.....	4	Pollock, W. B. & Co.....	31	Standard Horse Shoe Co.....	81	Whitton, D. E. Mch. Co.....	42
Miller Lock Co.....	77	Poole, Robt. & Son Co.....	29	Standard Steel Casting Co.....	98	Wickes, Bros.....	36
Millers Falls Co.....	56 & 98	Pope Mfg. Co.....	55	Standard Tool Co.....	46	Wickwire Bros.....	7
Millne, A. & Co.....	18	Popping, J.....	53	Standard Tool Co.....	57	Wilcox & Howe Co.....	84
Milton Mfg. Co.....	89	Port Chester Bolt & Nut Co.....	90	Stanley Rule & Level Co.....	97	Wiley & Russell Mfg. Co.....	41 & 98
Miner & Peck Mfg. Co.....	38	Portland Lawn Sprinkler Co.....	89	Stanley Works.....	55	Williams, J. H. & Co.....	84
Mohr, J. J.....	16	Pottstown Iron Co.....	18	Stark Mch. & Tool Co.....	37	Williamson, C. T. Wire Nov. Co.....	97
Monce, S. G.....	84	Pottsville Iron & Steel Co.....	15	Starrett, L. S.....	59	Williamsport Wire Rope Co.....	6
Montour Iron & Steel Co.....	20	Powell Planer Co.....	39	Steam Gauge & Lantern Co.....	74	Wilmot & Hobbs Mfg. Co.....	1 & 98
Moore, Dr. Gideon E.....	54	Pratt & Whitney Co.....	43	Stearns, E. C. & Co.....	64	Wilson, E. H. & Co.....	16
Moore Mfg. & Foundry Co.....	45	Prentiss, Geo. W. & Co.....	5	Stechert, G. E.....	48	Wilson, John.....	64
Moore & White Co.....	45	Prentiss Tool & Supply Co.....	49	Steel & Iron Improvement Co.....	54	Wilson, J. Fred.....	89
Moorhead-McCleane Co.....	21	Prentiss Vise Co.....	58	Steptoe, J. & Co.....	61	Wilson, W. A.....	39
Morgan Construction Co.....	4	Pullman, J. Wesley.....	21	Sterling Emery Wheel Co.....	47	Winslow, Sm'l, Skate Mfg. Co.....	70
Morgan Spring Co.....	4	Pullman Sash Balance Co.....	75	Sternbergh, J. H. & Son.....	90	Wister, Francis.....	16
Morrison, Robert.....	32	Putnam Nail Co.....	79	Stevens Arms & Tool Co.....	73	Wister, L. & R. & Co.....	20
Morse Twist Drill & Machine Co.....	46	Queen Anne Screen Co.....	72	Steward & Romaine Mfg. Co., Ltd.....	89	Wolcott & West.....	51
Morse, Williams & Co.....	45	Quint, A. D.....	48	Stiles & Parker Press Co.....	28	Wolff, C. H.....	77
Morton, Thos.....	74	Rainey, W. J.....	1	Stirling Co.....	36	Wolff, R. H. & Co. Ltd.....	5
Moseley Iron Bridge & Roof Co.....	7	Rand Drill Co.....	29	Stocking, E. B.....	6	Wollensak, J. F.....	58 & 78
Mount Carmel Bolt Co.....	97	Randolph & Clowes.....	1	Storm Mfg. Co.....	58	Wood Alan & Co.....	16
Myers, F. E. & Bro.....	58	Read, Wm. & Sons.....	97	Stover Mfg. Co.....	79	Wood, R. D. & Co.....	25
National Horse Nail Co.....	83	Reading Hardware Co.....	97	Stow Flexible Shaft Co.....	46	Wood, W. Dewees Co.....	21
National Manufacturing Co.....	64	Reece, Edw. F.....	42	Stow Mfg. Co.....	46	Woodruff, W. W. & Sons.....	28
National Pipe Bending Co.....	30	Reeves, Paul S.....	98	Sturtevant, B. F. Co.....	39	Worcester Mch. Screw Co.....	90
National Saw Co.....	60	Reliance Wire & Iron Wks.....	8	Sturtevant Mill Co.....	53	Worthington, Henry R.....	33
Naylor & Co.....	20	Reynolds & Co.....	6	Supplee Hardware Co.....	88	Wright & Colton Wire Cloth Co.....	8
Newark Machine Tool Works.....	54	R. I. Perkins Horse Shoe Co.....	81	Sweet Mfg. Co.....	86	Wrought Iron Bridge Co.....	13
New Britain Hardware Mfg. Co.....	89	Rhodes, L. E. Co.....	52	Sweetser, W. A.....	27	Wurster, F. W. & Co.....	98
New Castle Wire Nail Co.....	11	Richardson, C. F. & Son.....	60	Swindell, W. & Bros.....	26	Wyman & Gordon.....	25
New Haven Copper Co.....	2	Ridgway, Craig & Son.....	44	Syracuse Specialty Mfg. Co.....	87	Yale & Towne Mfg. Co.....	44 & 57
New Haven Mfg. Co.....	40						

WHEN IN NEED Address **MOUNT CARMEL BOLT CO.,**
MOUNT CARMEL, CONN.



DIRECTIONS FOR USING
WILLIAMSON'S NEW POWER CORK SCREWS.
KEEP ON TURNING, DO NOT PULL.

No. 1243, Nickel Plated, Apple Wood Handle,
1443, Rosewood

\$5.00 per dozen
5.50

For Discounts and Prices of other styles send for Catalogue.

C. T. WILLIAMSON WIRE NOVELTY CO., NEWARK, N. J.

Manufacturers of Wire Specialties for the Trade.

PRICE ISSUES OF 1894 WILL BE MET.



EAGLE ALUMINUM RIMS (Patented)

A 24 lb. Guaranteed Road Wheel.

Highest Grade. Correct Design.

Special ADVANCE Proposition

FOR THE

Hardware Trade

Samples (only) '94 Lines Ready for Delivery.

New Lines, New Features, New Patterns.

OUR SIXTH YEAR.

THE EAGLE BICYCLE MFG. CO.,

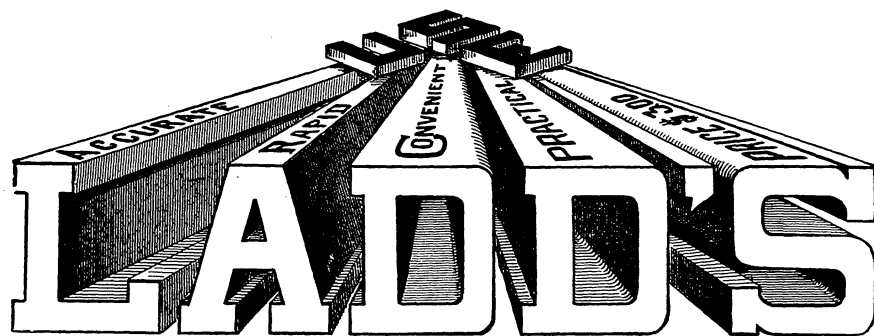
Makers of Highest
Grade Bicycles.

Torrington, Ct.



**MAKE YOUR-
SELF A**

Mechanical Engineer or Draughtsman; or qualify
charge of, or to superintend the manufacture of machinery by devoting your idle
hours to **Home Study** by the method of **THE CORRESPONDENCE**
SCHOOL OF MECHANICS, Scranton, Pa. To begin, students need
only know how to read and write. Moderate Charges. Send for **FREE Circular**.



Discount Book.

PRICE, \$3.00; DOUBLE INDEXED EDITION, \$4.00.

Sent, postpaid, to any address upon receipt of price, by

DAVID WILLIAMS, Bookseller and Publisher,

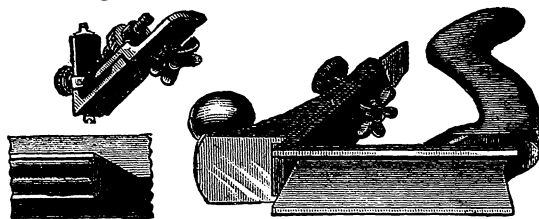
96 to 102 Reade Street. New York.

IMPROVED
Labor-Saving
CARPENTERS'
TOOLS.

STANLEY
RULE & LEVEL CO.
New Britain, Conn.

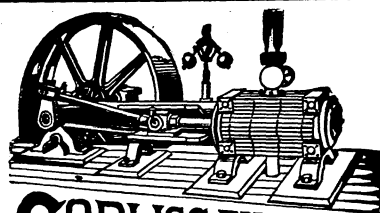
SOLD BY ALL
Hardware Dealers.

Stanley's Adjustable Chamfer Plane.



This Plane will do perfect chamfer or stop chamfer work.
For Beading, Reeding or Moulding a chamfer, an additional
section is furnished (price \$1.00) with six cutters, sharpened at both
ends, including a large variety of ornamental forms.

No. 72. Chamfer Plane, 9 inches in length, 1 1/4 inch Cutter... \$2 00
No. 72 1/2. Chamfer Plane, with Beading Attachment..... 3 00



CORLISS ENGINES
MACHINISTS
IRON FOUNDERS, BOILER MAKERS,
ROBT. WETHERILL & CO.
CHESTER, PA.

Look! Look!!

1894 MODEL BICYCLES

FOR HARDWARE TRADE.



New 1894 Model **NEW MAIL**. Highest Grade,
10 years' reputation. Also **BEST LINE** cheap and
medium grade wheels in the market. Address

WM. READ & SONS,

107 WASHINGTON ST.,

BOSTON.

ESTABLISHED 1826.

MUST SECURE AGENCY NOW!!!



CROWN and GIANT BRAIDED

Sash Cords, Bell Cords, Mas-
son's Lines, Clothes Lines,
Bright Wire Goods, Picture
Wire Nails, Knobs and
Hooks, Brass Chain, Spool
Wire, Etc.

OSSAWAN MILLS CO.,
Norwich, Conn., U. S. A.



A Satisfied Purchaser.

To whom it may concern: I hereby ad-
vise all persons and companies to have
the **MASON REGULATOR CO.'S DEPTH**
GAUGE, as I have had the best of satis-
faction from them, and hope companies
will not be deceived by imitations.

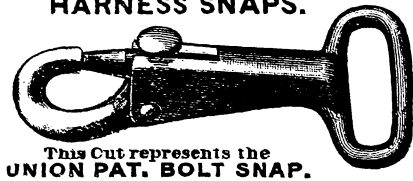
(Signed) Geo. Lang, Jr.

Chickasaw, Ala., Oct. 16th, 1893.

(To Mason Regulator Co., Boston.)

Price, 40 cents, post-paid.

THE W. & E. T. FITCH CO.,
NEW HAVEN, CONN.
Manufacturers of a variety of
HARNES SNAPS.



This Cut represents the
UNION PAT. BOLT SNAP.

PAUL S. REEVES,

Philadelphia.

Phosphor Bronze

AND

BABBITT METALS.

Lead Lined Car Bearings a Specialty.

Brass and Phosphor Bronze Castings from $\frac{1}{4}$ pound to 20,000 pounds in weight.

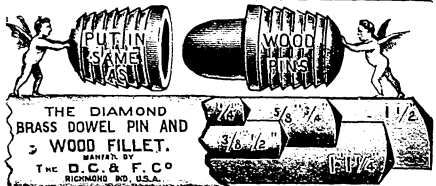
STANDARD STEEL CASTING CO.
THURLOW, PA.
STEEL CASTINGS
QUALITY EQUAL TO STEEL FORGINGS

BURGESS & LOXLEY,

Malleable Iron and Small Steel Castings.

MILITARY ROAD & CHANDLER STREET,
BUFFALO, N. Y.

NORWAY IRON RIVETS.
FOR ALL PURPOSES.
WRITE FOR PRICES
TO
THE BOYCE RIVET CO.
MUNCIE, INDIANA.



STEEL TUBES
WELDLESS
OCCUR DRAWN
BY THE
JOHN S. LENG'S SON & CO. NEW YORK.

DAYTON
MALLEABLE
IRON CO.
DAYTON, O.
HIGH CLASS
CASTINGS A SPECIALTY.



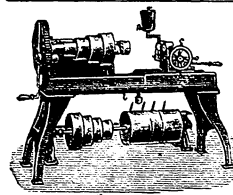
STANLEY G. FLAGG & Co., Philadelphia, Pa.
Office and Works, N. W. Cor. 19th St. & Pennsylvania Ave.
Manufacturers of **STEEL CASTINGS**,
A Substitute for Steel and Wrought Forgings.
Circulars Sent on Application.

HOLIDAY GOODS.

See Page 56.

MILLERS FALLS CO.,
93 Reade St., New York.

SPRINGS AND AXLES
ROLLING MILL.
F. W. WURSTER & CO.
375 Kent Ave. Brooklyn N.Y.



No. 48 Green River
Bolt Cutting, Nut-Tapping
and Pipe Threading
Machine, for
Power or Hand use.
MADE BY
WILEY & RUSSELL
MFG. CO.,
Greenfield, Mass.
Send for New Catalogue.

ESTABLISHED
Spring Making, 1842. Steel Making, 1845.
Norway Iron, 1871 (Re-Rolled).

WM. & HARVEY ROWLAND,
MANUFACTURERS OF
Springs, Steel, Re-Rolled Norway
Iron & Slit Norway Nail Rods.

Address FRANKFORD P. O., PHILADELPHIA.



A. G. PECK & CO.
Cohoes, N. Y.
MANUFACTURERS OF
AXES, ADZES,
BROAD AXES,
HATCHETS.

Send for Catalogue and Price List.

LIDGERWOOD
HOISTING ENGINES.

300 styles and sizes. Over 9500 in use.

LIDGERWOOD MFG. CO., 96 Liberty St., N. Y.

DOG COLLARS,
DOG MUZZLES.

THE
CHAPMAN
MFG. CO.,
Meriden, Conn.



JOHN SOMMER'S "FEARLESS" FAUCETS
BEST
BLOCK TIN KEY,
WITH
LEATHER
LINING
MAPLE WOOD BODY
HIGHLY POLISHED
ONLY THE GENUINE ARE STAMPED
IN THE WOOD WITH TRADE MARK
WITH TRADE MARK
AS PER CUT
BEWARE OF IMITATIONS
FAUCETS SIMILAR IN SHAPE
WITH LEAD OTHER METALS
TINNED OR NICKELLED
JOHN SOMMER'S SON, MFR, 8-12 PEARL ST, NEWARK, N.J.

RUSSELL, BURDSALL & WARD,
Portchester, N. Y.,
Manufacturers of
Carriage, Tire, Plow and Stove
BOLTS

Carriage Bolts made from Best Square Iron a
Specialty.

EUREKA CAST STEEL COMPANY.
Office and Works, Chester, Pa.
Open Hearth, Crucible and Eureka Steel Castings.
Railroad and Machine Castings.
Locomotive Cross-Heads and Gearing a Specialty.
Guaranteed Knuckles for M. C. B. Couplers.

Solid Steel Castings
From Crucible and Open Hearth.

Steel and Gun Metal Rolls
Specialties.

Air Furnace Refined
Malleable Castings.

ISAAC C. JOHNSON & CO.,
ESTABLISHED 1853,
SPUYTEN DUYVIL, NEW YORK CITY.

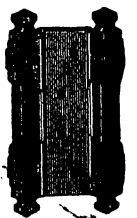
"COPPERIZED C.R. SWEDON
STEEL ANTI-RUST OILERS & C.
ALL SIZES & STYLES
BURNISHED FINISH
CHEAP & ELEGANT
SCALE 1-12 SIZE
TRADE MARKS
REGD.
LARGE STOCK, BEST OF GOODS & FACILITIES
THE WILMOT & HOBBS MFG. CO.
HOT & COLD ROLLING MILLS AND FACTORIES
BRIDGEPORT, CONN. U. S. A.
STORE, 20 MURRAY ST., NEW YORK.

		JAPANNED.	
		Length of Flanges	Single Acting.
Feet.	Inch.		
6x2	$\frac{3}{4}$ to $1\frac{1}{2}$	3 in	63
7x2	$\frac{1}{2}$ to $1\frac{3}{4}$	4 in	64
7x2 $\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{3}{4}$	5 in	65
7x2 $\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{3}{4}$	6 in	66
8x2 $\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{3}{4}$	7 in	67
8x3	$\frac{1}{2}$ to $2\frac{1}{4}$	8 in	68
9x3	$\frac{1}{2}$ to $2\frac{1}{2}$	10 in	69

For SCREEN, MEDIUM AND HEAVY DOORS.

Single and Double Acting.

THE $\frac{3}{4}$ AND 4 INCH
ARE THE BEST IN
THE MARKET FOR
SCREEN DOORS.



Send for full Catalogue of Bronzed, Brass and
Bronze Metal Spring Hinges.

MANUFACTURED BY

VAN WAGONER & WILLIAMS CO.
CLEVELAND, O. and 14 WARREN ST., N. Y.

THE IRON AGE

THURSDAY, DECEMBER 28, 1893.

The Hodge-Frazier Taper Turning Attachment.

This attachment is designed to be used on any lathe. It can be quickly and easily transferred from one lathe to another and can be attached to a plain gib, raise and fall, or compound rest carriage. The device consists of a dovetailed bar fitted to slide in guides carried by the carriage of the lathe. From one end of this bar projects a connecting rod, which is grooved in several places to receive the binding screw of a clamp fastened to the lathe bed. Pivoted at one end to this bar is

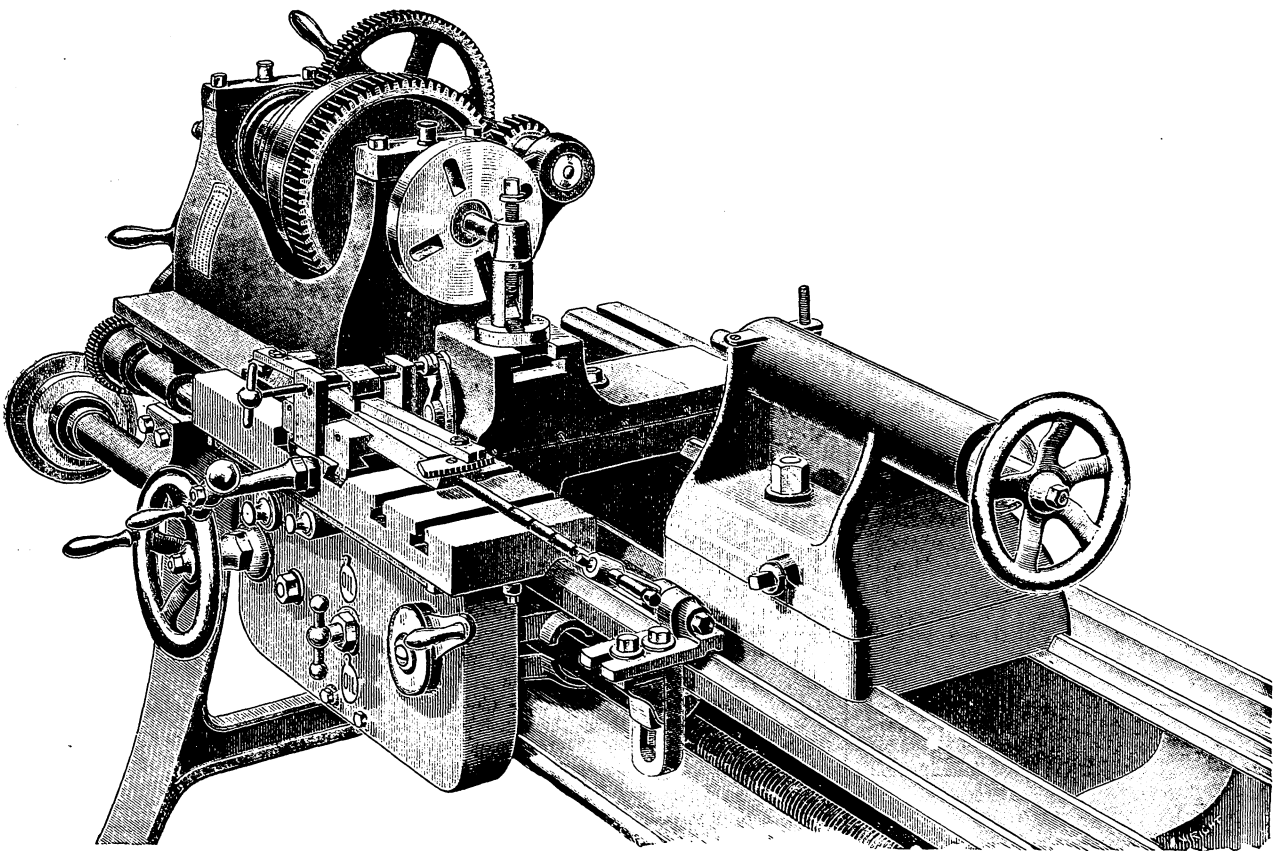
able to state positively that this same material is being sold at \$2.50 per 100 pounds, free on board mill.

Cost Keeping.

Notwithstanding its vital importance, the matter of accurately obtaining the cost of a manufactured product in detail, or of individual machines or parts of machines, frequently receives but meager attention. The annual balance, or, may be, deficit, is taken as a measure of the relation between the total cost and the selling price of the aggregate product, but just where

Obviously the same holds to an even greater extent in machine manufacture, where the more detailed the information the more serviceable it becomes in determining where to cut in the cost or upon what figure to decide for a selling price.

The indefinite item of factory or establishment expense, covering fixed changes and to be added to the net cost of the article, frequently leads by its improper application to a distortion of the values. This can be avoided only in so far as the various items of this expense are charged directly to the article made, rather than lumped with others in a general percentage.



THE HODGE-FRAZIER TAPER TURNING ATTACHMENT.

the taper bar, the other end of which is graduated so that any desired taper can be obtained by securing the bar at the desired angle in relation to the center line of the lathe. Sliding jaws are fitted to the taper bar and are connected to the cross slide. From the above and by reference to the engraving the construction and operation of the device will be understood. This attachment is placed on the market by the Prentiss Tool & Supply Company of 115 Liberty street, New York.

A few months ago *The Iron Age* made the statement that No. 27 gauge sheet iron for roofing purposes, which is called No. 27 standard, but really weighs $\frac{1}{16}$ pounds per superficial foot, was sold at \$2.65 per 100 pounds, free on board mill. Exception was taken to the statement, although it was proved to be correct. We are now

money is lost and just where it is made is by no means so definitely known. Doubtless in almost every manufacturing business handling a variety of goods certain classes serve by their large profits to carry along the others, which could not stand by themselves.

Even such cost keeping systems as are in operation in some concerns are often so crude or general in their character as to preclude the possibility of obtaining accurate detailed information. Then, too, methods are sometimes incorrect or misleading. The foundryman who merely knows that the average cost of his completed castings is so much per pound is in no position to compete in prices on close estimates with the man who knows individually the cost of his iron in the ladle, and the average expense for snagging, pickling, rattling, &c., so that he may thereto add his known or carefully estimated cost of molding.

Nothing is more evident than that no one system of cost keeping is applicable to all classes of manufacture. The following general scheme appears, however, well fitted to the average establishment making a variety of articles of reasonable size :

In the first place, the hours of labor for which a man is to be paid and the time which he devotes to any given article or process are kept entirely separate. Time under the first heading is kept by any approved check or time clock system, and the pay roll made up therefrom. But the labor upon the specified piece is recorded upon a time slip, giving order number, hours worked, name of piece, character of work performed thereon, and number of tool employed to perform the work. This is signed by the workman, and as soon as the operation is completed passes to the foreman, who duly inspects and countersigns it.

At stated intervals, preferably every morning, these slips are collected, together with any orders, sketches, stock memoranda or the like relative to the same completed work. These records are all filed in a single envelope properly inscribed and numbered. There thus accumulates from day to day a complete record of the progress of the work, which may be consulted at any time. When all slips and orders are collected the filled envelope stands as a complete record of all written orders given, of the date of their fulfillment, of the total amount of stock used, and a detailed individual record of all work done.

In a piece work shop, piece work receipts properly signed by the inspector take the place of the time slips, but still continue to show the progress, and when checked up by piece work price-lists also determine the cost. Outside work upon installation, orders to the purchasing agent, corrections of orders and the like all go into the envelope with the rest.

The marked value of this system lies in the facts that no clerical work is required, unless the cost of the given article is to be figured, and that at any time, no matter how distant from the date of completion of the order, the full record may be taken from the files and the detailed cost determined. This is an important feature where goods are built to be sold at standard prices and costs require to be figured only at intervals.

This system in actual operation has shown itself readily adaptable to existing circumstances, elastic to a remarkable degree and free from the peculiar inconvenience of many book systems, where many pages must be scanned to obtain all the time chargeable to a given order.

Statistics of overland passenger traffic by the Southern Pacific for the month of November show clearly how largely the westward migration exceeds that in the other direction. The returns of passengers carried, which are said to present a very fair similarity to the average figures, are as follows:

	East-ward.	West-ward.
First class.....	1,348	4,793
Second class.....	1,831	6,468
Totals.....	3,179	11,261

The carrying capacity of vessels lost on the lakes during the past season, says the *Marine Review*, is about 17,000 tons less than that of the new vessels now under contract in the shipyards, and thus for the first time in eight years there is a halt in the great increase in tonnage. In previous years the tonnage of new vessels under contract each fall has been so much in excess of the losses of the previous season as to cause little attention to be given to the latter.

The dullness in the iron and steel trade has now extended to the natural gas fields of Ohio and Indiana. Manufacturers in this district state that during the hard times of this year they have been able to hold their own in competition for the few orders distributed, but they now assert that, notwithstanding free gas and other advantages, they are not disposed to allow the lowest of present prices to be entered on their order books; consequently, most of the mills are only running half time. A few weeks ago, in passing through the same territory, our correspondent noticed everything going full blast.

Basic Bessemer Costs.

(Concluded from page 1121, December 21.)

Taking up each item singly and examining it in detail, the following results are obtained:

IRON.

Charleroi exceeds American estimate, \$0.291
American estimate exceeds Charleroi.

This excess at Charleroi, in spite of the fact that the iron there costs \$1.49 per ton less than on sheets II and III, is caused entirely by the high loss, viz., 20 per cent. According to Torduer, Charleroi only produces 80 per cent. of ingots, the balance is total loss, no credit being given for scrap. The figures that I use here both as to the cost of the pig and to the loss are perfectly attainable, and in so far as the loss is concerned one at least of the continental plants is doing even better, and I know of no reason why the American practice should not equal and perhaps improve on their results.

COAL.

Charleroi excess.....
American excess.....0.16

The cost price of this item is less on Sheet I than on Sheets II and III. The vital point, however, here lies in the weight used per ton. Comparing the foreign consumption of 363 pounds with Mr. Howe's figures for a fast running acid Bessemer, about 200 pounds per ton, it seems, and I have already so remarked in this paper, as though the weight was too low, and I have used much higher figures for the American estimate. In this connection, however, it must not be forgotten that the method of keeping the accounts enters very largely into this result. Mr. Howe plainly says "steam fuel," but I am not sure whether this means boiler fuel alone or all fuel used in or about the converting mill, such as coal for the small locomotives, the ferromanganese furnace, &c.

Mr. Torduer simply uses the word coal. This certainly can only be taken as including all coal chargeable to the converting mill and this, I think, is also what Mr. Howe means. On sheet II I have placed the consumption at 500 pounds, and on sheet III at 400 pounds per ton of ingots. Both of these plants would be very slow running, as compared with Mr. Howe's swift plant, and I do not believe that Mr. Torduer's figures are attainable unless he uses the triple expansion engines spoken of later in his paper. Such engines are not at present in use in the still works in this country. It is very noticeable how little more coal is required to run fast than to run slow, and how rapidly the cost of this item decreases per ton as the tonnage of output increases. The costs on sheets II and III are for bituminous coal. If these plants were constructed with sufficient boiler capacity to run on small sizes of anthracite coal, these figures could be materially reduced.

WOOD, WASTE, OILS, ETC.; REPAIRS, LABOR, MATERIALS, SHOP ACCOUNT.

These are, perhaps, all considered by Mr. Torduer under the head of sundries, although it is hard to see why the repair account is not considered of enough importance to be entered separately, and it is possible that it has been omitted. Since the sum of these items just equals the amount charged for sundries, it is probable that the better American prac-

tice, in this case, at least, makes up for the great difference in the cost of the labor.

COKE.

Practically the whole of this item may be charged to the use of the indirect process—cupola melting—and would form a portion of the saving to be effected by running direct. The bulk of the coke used by Charleroi must be charged against the dolomite, since this item is treated as raw stone and no spiegeleisen is used.

Considering, therefore, that all of it is used for burning the dolomite, the total cost—less labor, it being included in the conversion labor—is only 20 cents against 0.45 cents on sheet II and III. This is one of the most striking differences between the plants, but in considering it the marked difference in the cost of labor between the two countries must be borne in mind.

It really seems as though Mr. Torduer was wrong as regards the cost of dolomite per ton, since the text, I think, fully sustains my assumption that he is talking about raw stone; and if that is so, since this stone, quoted at \$1 per ton, loses at least 50 per cent. during calcination, the cost per ton of ingots could not be less than twelve cents. This question was touched upon when discussing the comparative costs of the lime and dolomite, but no mention was then made of this particular error. The fuel and labor for burning are charged on the cost sheet, but no allowance is made for the loss during calcination. This adds to the evidence against the correctness of the figures for these items.

CALCITE.

Used as a flux on the cupola and is, therefore, directly chargeable to the Indirect Process.

LIME.

Charleroi excess.....
American excess......245

Eighteen and nineteen per cent. is the amount used at Charleroi. An average of not over 16 per cent. is the more usual practice, and the results obtained are undoubtedly as good, if not better, than at Charleroi. Note the difference in the first cost—\$1.60 as compared to \$4—just two and one-half times as expensive in the States as on the Continent. If this same comparison held good in each case—viz., that two and a half times the European cost equaled the American cost, no further inquiry into this great difference in the cost of conversion would be necessary. While it will not hold strictly to this proportion, still there is a constant difference caused by that great underlying fact, low wages in Europe, high wages in America, that cannot be overcome completely by any existing better plants, better processes or smarter workmen that we Americans are supposed to possess.

TAR.

Charleroi excess.....
American excess.....0.156

The cost price here is about one-third greater.

FIRE BRICK, FIRE CLAY, KAOLIN, GAN-
NISTER OR ACID REFRACTORIES.

Charleroi excess.....0.113
American excess.....

It is possible that the vessel nose at Charleroi is lined with acid materials, but I would not propose so doing in the plants estimated on here and also that such acid materials as are required on the dolomite cupola are charged into

this item, such not being the case on sheets II and III, where the basic refractories are charged on the conversion cost sheet at their cost of manufacture, and this naturally includes the labor of their production, acid refractories, &c.

CUPOLA TUYERES AND BLOCKS.

This lining material for the cupolas is of coruse directly chargeable to indire process.

MOLDS AND STOOLS.

Charleroi excess.....	—
American excess.....	0.01

There is but a slight difference here between the two countries and it certainly shows better work since the American practice, in spite of the higher first cost of the molds, approaches so near the continental figure per ton of ingots. A varied output requiring many different and odd shapes of molds would increase this cost.

SLEEVES, NOZZLES AND STOPPERS.

Charleroi excess.....	0.031
American excess.....	—

These three items are evidently taken under the one head of stoppers by Mr. Torduer. It will be noticed in this case, as in the fire brick item, that the Belgian cost exceeds the American. From the general tendency of all the other factors, or as one might say, from the internal evidence, we are warranted in assuming that the cost price of all these acid refractories is much less than in the United States. If, then, the cost per ton of ingots is still less with us, it must be because we use very much less of these materials and our practice is therefore more perfect in this particular.

SHIFTING.

Charleroi excess.....	0.018
American excess.....	—

I have previously criticised the wage list of this paper because it did not contain engineers and trainmen enough, according to my idea, to handle the intermediate products of the mill.

Under this particular heading I should include only the work of handling raw stock and finished material, the receiving from and delivery to the railroad companies of the loaded and empty cars, and the necessary handling of these cars over the mill tracks. As this figure exceeds the American practice so greatly it is easily possible that by a different method of keeping the accounts Charleroi charges to this item some of the men that I have accused Mr. Torduer of omitting.

INSURANCE AND TAXES, STATIONARY STEEL INCIDENTALS, LABORATORY CAR ACCOUNT

Charleroi excess.....	0.036
American excess.....	—

Can all be grouped together and charged against the general expense account.

SALARIES.

Charleroi excess.....	—
American excess.....	0.040

This item is entirely omitted, I believe, by Torduer, at least I can find no evidence of its being included under any other head, and as it is, though not large, still an ever present factor, I am inclined to think that there may be other items that I have in the first place put in the "omitted" list, but later on endeavored to include under some other title in this balance sheet, that he has in reality disregarded and which,

though small in themselves, would in the aggregate amount to a very considerable sum.

LABOR.

Charleroi excess.....	—
American excess.....	1.082

Referring again to the one or two apparent errors in Mr. Torduer's labor list, and supposing that as many men as were thought necessary were added to that list, if all the items that he has, perhaps, omitted were also inserted, the total cost could not be increased over 50 cents per ton.

It is not here that the great difference in the cost of conversion lies, but in the labor rates.

In the report of the United States Commissioner of Labor for 1890 on the cost of production of steel ingots, p. 342 et seq., the following average daily earnings per man are given:

American establishment—	
No. 1.	No. 2.
No. 5.	No. 7.
2.03½	2.35
1.78½	3.02½

an average of \$2.29.

Comparing this with the average daily rate of \$0.68 paid the Belgian worker, it is not hard to understand why the American labor exceeds that at Charleroi by \$1.08 per ton of ingots, nor why in so many other cases where the quantities of materials used are nearly alike, the American cost is so much greater than Belgian.

FERROMANGANESE AND SPIEGELEISEN.

Charleroi excess.....	0.404
American excess.....	0.540

In the first of these items it is presumed that almost double the quantity required abroad will be necessary here. This not because of any error or bad practice at either plant, but on account of the quality of the steel to be made. The American builder, be it of bridges, boats or boilers, does not want and the specifications that he furnishes will not permit of the use of such soft steel as is almost universally used on the Continent. The soft steel, "Flusseisen" of the German steel maker, is true to its name. It is much nearer in its physical qualities to iron than anything made by a so-called steel process in this country. Superior to wrought iron on account of possessing a slightly higher ultimate strength in connection with a greater reduction of area and elongation, it surpasses much of what we Americans call "soft steel" and which would be the class of material furnished by the plant under discussion, in so much as among its other advantages while passing through any subsequent stages of its manufacture, no amount of ill treatment (except burning, and this is extremely difficult to do) can spoil it. Punch it, drift it, ream it if you like, and it will be still the same ductile mass that it was when you commenced. Heat it, chill it, try to harden it, to temper it and its physical characteristics will remain unaltered or, if changed at all, be somewhat softer. This, however, is not the sort of steel that there is a demand for to-day and consequently the American plant would have to stand the extra expense of adding the recarburizer as shown here. As to the spiegeleisen, a portion at least of that undoubtedly could be done away with by the use of fine coke.

Now let us suppose that the pig iron cost \$10.51, as at Charleroi, instead of \$12, and that the loss was the same as on sheets II and III. In this calculation only the price of the pig iron has been changed, the steel scrap and burnt

or cast iron scrap have been left as on the American estimates :

Sheet II—	\$7.818 — (\$1.809 — \$1.729) = \$7.738.
Sheet III—	\$6.944 — (\$1.809 — \$1.729) = \$6.864.

If now the wages he considered on the comparison of the Belgium daily average of \$0.68, as against the American daily average of \$2.29, then the cost per ton on sheet II would be \$0.476, or a reduction of \$1.124, and on sheet III \$0.446, or a reduction of \$1.054 per ton, hence

Sheet II—	\$7.738 — \$1.124 = \$6.614.
Sheet III—	\$6.864 — \$1.054 = \$5.810.

Now, for the sake of this comparison we will suppose that the American plant makes steel of the same degree of hardness as the Continental Flusseisen. The recarburizer account would be reduced to 35 cents.

Sheet II—	(\$0.704 + \$0.540) — \$0.35 = \$0.894, and \$6.614 — \$0.894 = \$5.72.
Sheet III—	(\$0.704 + \$0.540) — \$0.35 = \$0.894, and \$5.810 — \$0.894 = \$4.916.

This shows a cost of conversion for sheet II of \$5.72, compared with the Charleroi rate of \$4.64, giving an excess of \$1.08, and for sheet III \$4.916, an excess of \$0.276.

This excess remaining against the American single turn plant, \$1.08, can hardly be compared intelligently against the Charleroi costs, since the conditions are still very different, but we may well ask why the double turn plant should not show a cheaper cost instead of being \$0.276 higher, since we have as nearly as possible made the conditions of it and Charleroi similar, and in the one case of a greater production given it a decided advantage.

By recapitulating the differences we may possibly find where this variation lies:

	Charleroi exceeds American estimate.	American estimate exceeds Charleroi.
Iron.....	\$0.291	.....
Coal.....		\$0.16
Wood, oils, waste, &c. { Sundries	.....	.....
Repairs.....		.....
Coke.....		0.245
Lime.....		0.156
Tar.....		.....
Fire brick, { Fire brick,	0.113	.....
Fire clay.....		.....
Kaolin and gannister { sand, &c.		.....
Molds and stools.....		0.010
Sleeves.....		.....
Nozzles.....		.....
Stoppers.....	0.031	.....
Shifting.....		.....
Insurance and taxes, { General		.....
Stationary incidentals, { al ex-	0.036	.....
Laboratory car account } penses.		.....
Salaries.....		1.082
Labor.....		.....
Ferromanganese.....		.....
Spiegeleisen.....		.....

I have purposely omitted from this recapitulation the variations on doubtful items, such as coke, shifting and salaries, also the ferromanganese and spiegeleisen, since it is solely a change in practice, caused by the demands of the trade that makes the difference on these latter items.

Glancing over the column headed "Charleroi exceeds," the increased cost of the iron, in spite of its cheaper initial price, is first noticed. This increase is brought about mainly by the more wasteful and slovenly practice credited to Charleroi by M. Torduer, and also by his method of calculation.

If the American plant were furnished with iron at a like figure, there is no reason to suppose that the loss would be increased; and, as already shown, the cost of the loss (iron) would be further reduced and the total cost of ingots would be only \$15.87, as against the \$17.44 now shown on Sheet III. The excess in the two items—fire brick, &c., sleeves, &c.—can, I believe, be directly credited to the better American practice, while the difference in the fourth and last one is mainly chargeable to the increased product given on the estimated sheet to the American plant.

Taking the next column, the extra cost of the coal to the American works is almost entirely the result of the larger amount that I have assumed would be used, and as I have endeavored to throw some doubt on Mr. Torduer's figures for this item it may, perhaps, be permissible to leave it out of the discussion. If it is considered, however, we must be forced then to admit that our practice is not equal to the European in this particular.

As regards the lime, it is the high initial cost which alone causes the great difference, especially as I have calculated on the American plant using a less percentage than Charleroi does. The price used on Sheet III is somewhat less than the current market price. It is supposed, though, that the plant will have its own lime kilns, and this figure will then be easily attainable. If the lime could be had at the continental price given by Mr. Torduer the American plant would again show a saving.

The first cost of the tar is higher here than in Belgium, and this, together with the increased amount that I have estimated on—for I am afraid of Mr. Torduer's figures—accounts for the excess.

The difference in the molds and stools is too slight to discuss.

The great excess in the labor cost is the most striking figure in the whole column, and is in reality the key of the situation. It has previously been shown that this is brought about directly by the enormous difference in the labor rates—*vide* quotation from report of United States Commissioner of Labor—and the fact is also plainly patent by the most cursory comparison of Mr. Torduer's wage list with that of any steel works in this country. This fact—the low labor rates—would also affect the price of every article on the list, and in the case of the other great difference in this column, to wit: the lime costs, a marked effect would be shown there, since 50 per cent. of the cost of the burning and about 60 per cent. of the cost of the raw stone represent the labor expended.

From the result of the analysis of these figures it seems as if the American practice could fully equal the work cited by Mr. Torduer. If then we paid wages correspondingly low, our finished work—for it seems useless to dispute, in the light of what has already been shown, his statement that with ingots at less than \$15 beams could be made for not over \$18—would cost not more and probably less than the figures he quotes.

It must not be forgotten when looking longingly at these low cost figures who the sufferer would be were any attempt made to reach them or if our policy of government should ever force us to meet them. In every case, and view it in any position that you like, it is always the labor—that is, the laborer, the working man—who must bear, practically the whole of this re-

duction. It can be plainly seen that in the figures used in this article no attention has been paid to the profits of the owner or manufacturer, and in any attempt to meet the Belgian price in the open market the difference would have to be taken from some of the costs enumerated herein.

Practical Application of the Pyrometer.

The growing necessity of uniformity in the quality of iron or steel products has caused a closer study of scientific phases when metal of specified ductility is required. Old methods of judging by the eye are fast becoming obsolete, and with the increasing use of the pyrometer to ascertain and regulate temperatures of furnaces, the old secrets of managers and others, who have passed them from one generation to another, do not possess their former value.

The pyrometer is by no means a modern instrument, but its utility and value are being daily demonstrated. In annealing malleable castings, sheets of iron and steel and other iron and steel products it is required that a certain temperature be maintained in the furnaces for a given number of hours to produce a desired result. To accomplish this it has hitherto been the custom to train men in charge of furnaces so that they could make a tolerably accurate guess regarding the temperature by withdrawing a stopper and peeping into the furnace. This was a method full of uncertainties, and to make results more positive the pyrometer is now fast coming into general use.

For the benefit of those not having an available table at their command we print below the temperatures of iron, steel and other metals under various conditions according to the very latest scientific investigation:

Temperatures.		Fahren- heit.	Degrees.
Bright iron becomes	yellow.	435	
	red.	500	
	indigo.	550	
	gray.	750	
Tin melts.		445	
Mercury boils.		660	
Lead melts.		612	
Zinc melts.		775	
Silver melts.		1,775	
Copper melts.		1,885	
Gold melts.		1,900	
Iron bar, red in	a dark room.	950	
	ordinary office.	1,075	
	daylight, open air.	1,450	
Cast iron melts	white.	2,075	
	gray.	2,230	
Annealing	malleable castings.	1,600 to 1,750	
	sheet iron, No. 40	and lighter.	1,600 to 1,700
Annealing glassware.	sheet iron, Nos. 18 to 10.	1,750 to 1,800	
		500 to 1,000	
Bessemer Process:		Centi- grade.	Fahren- heit.
Running the slag.		1,580	2,876
Running steel into ladle.		1,640	2,984
Running steel into mold.		1,580	2,876
Annealing furnace, ingot in.		1,200	2,192
Ingot under hammer.		1,080	1,976
Siemens-Martin Process:			
Gas from producers.		720	1,328
Gas entering generator.		400	752
Gas leaving generator.		1,200	2,192
Air leaving generator.		1,000	1,832
Fumes passing to shaft.		300	572
End of fusion of charge, open hearth.		1,420	2,588
Refining the steel.		1,500	2,732
Running into ladle, first.		1,580	2,876
Running into ladle, last.		1,490	2,714
Glass furnace, between the pots.		1,375	2,507
In the pots, refining.		1,310	2,390
In the pots, working.		1,045	1,913
Siemens, melted for casting.		1,310	2,390
Blast Furnace, Gray Besse- mer:			
Front of tuyere.		1,930	3,508
At tapping.		1,570	2,853

By preserving this table and carefully using a pyrometer those in charge of

furnaces will avoid mistakes which are often very costly. It is frequently the case when new men are put to work at a furnace that they are entirely too energetic. The furnace is kept too hot and the material spoiled, annealing boxes are burned and general trouble results. On the other hand, an old employee, depending too much on his former success, may grow careless and keep the furnace at too low a temperature. The charge is drawn after the furnace is cooled down, the result is not satisfactory and the material has to go through the process a second time at the expense of the manufacturer. By using a pyrometer and enforcing a system of recording temperatures every hour these troubles can be avoided.

The Bureau of Statistics has published for the Ways and Means Committee a tabulation of the imported merchandise entered for consumption in the years 1890 to 1893, with the rates and amounts of duty collected. This tabulation goes into far greater detail than do the monthly or annual reports relating to imports. Among other figures which may be of interest we note the imports of pig iron are separated into three groups, *spiegel* and *ferro*, *ferrosilicon* and all other. It appears that the imports of ferromanganese and *spiegeleisen* were during the fiscal years as follows: 1890, 108,771 gross tons; 1891, 54,238 tons; 1892, 55,080 tons, and 1893, 49,157 tons. The imports of ferrosilicon were 51 tons in 1892 and 255 tons in 1893. The imports of "all other" pig iron amounted to 39,299 tons in 1890, 27,307 tons in 1891, 28,145 tons in 1892, and 13,232 tons in 1893. The imports of scrap were:

Imports of Scrap.		Iron.	Steel.
1890.		35,357	2,443
1891.		47,730	7,442
1892.		29,236	7,551
1893.		14,331	5,831

As showing the magnitude of the Swedish business we copy the following table:

Imports of Charcoal Bars, Billets and Shapes.		Tons.	Value.
1890.		26,021	\$1,072,912
1891.		17,910	760,439
1892.		18,401	732,259
1893.		15,710	603,243

The imports of beams and structural shapes were as follows:

Imports of Beams and Structural Shapes.		Pounds
1890.		4,845,613
1891.		6,954,943
1892.		18,235,277
1893.		11,241,473

Under the general classification of wheels, or parts thereof, and steel tired wheels and tires we found the following figures, which, of course, deal almost exclusively with tires:

Imports of Tires.		Pounds.	Value.
Fiscal years.			
1890.		3,247,580	\$265,678
1891.		5,821,892	194,089
1892.		8,575,815	264,494
1893.		15,361,011	458,700

It will be observed that there has been a considerable increase during the fiscal year 1893.

Recently two ships have arrived in New York from Japan, carrying, respectively, 900 and 600 tons of manganese ore. It is stated that the latter lot was purchased by a large Pittsburgh concern.

Universal Die and Roll Grinding Machine.

This machine—built by the Waterbury Farrel Foundry & Machine Company of Waterbury, Conn.—is de-

signed especially for outside and inside grinding, where the work can be carried on the face plate or in the chuck. Its novel features are that in changing from cylinder to face grinding the grinding wheel does not have to be run

at right angles to the countershaft, but at all times and for all work rotates in about the same plane as the overhead drum on countershaft, and this permits the application of an automatically reversing, traversing mechanism to the wheel carrying side.

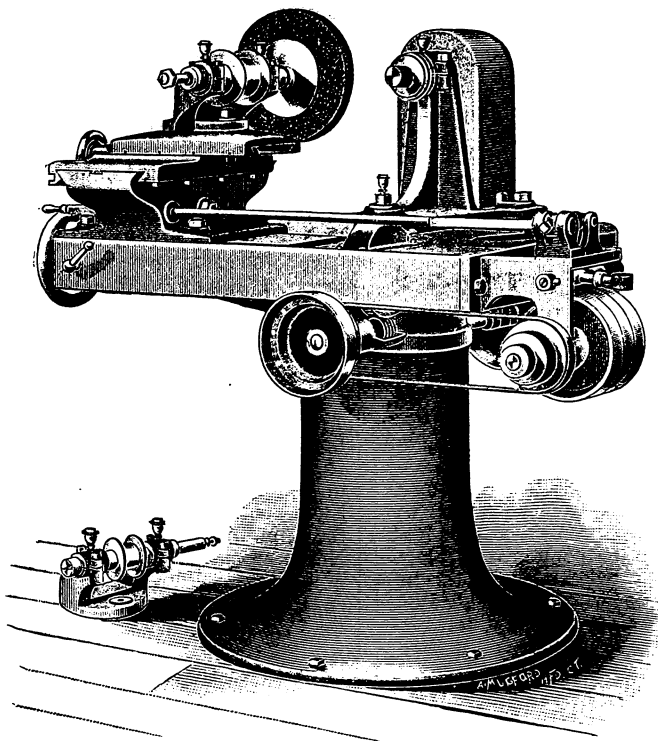


Fig. 1.—Perspective.

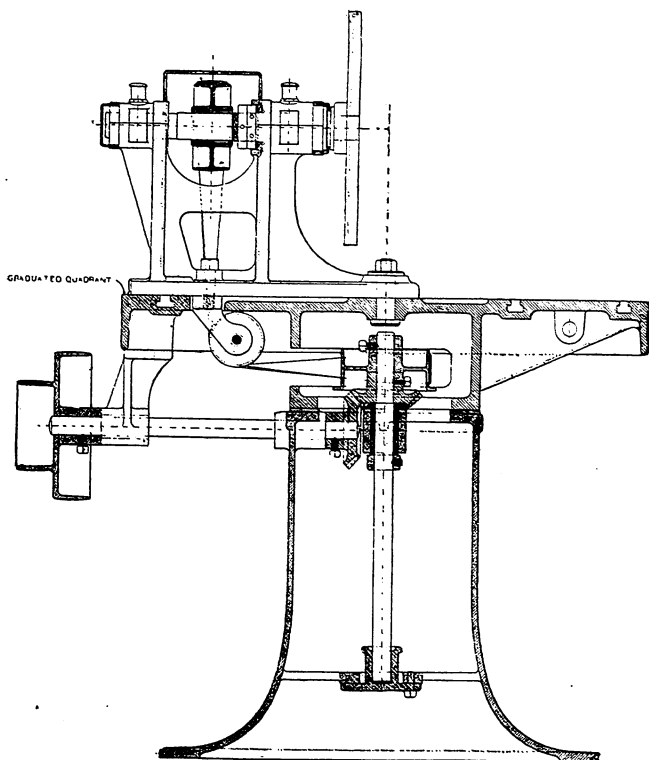


Fig. 2.—Vertical Section.

UNIVERSAL DIE AND ROLL GRINDING MACHINE.

signed especially for outside and inside grinding, where the work can be carried on the face plate or in the chuck.

Its novel features are that in changing from cylinder to face grinding the grinding wheel does not have to be run

The amount of the traverse may be varied up to 10 inches, and to adapt it to varying sizes of work a suitable position may be quickly given to the base of the traverse carriage, within a limit of 6 inches to or from the work. The

head carrying the wheel is movable by screw at right angles to the traverse to an extent of about 4 inches, and being swiveled may be further adjusted in angular position for special cases. The automatic traverse may be quickly thrown out by the small lever handle shown at the left, at which time the motion of the carriage may be entirely regulated by the hand wheel in front of machine (at left of cut). The speed of the feed may be varied through the cone belt shown.

The method of turning the work for face grinding is not clearly shown in the illustration, but may be described as follows: The counter drives a pulley which is nearly opposite the cone shown in the center of the engraving, and which through miter gears runs a vertical shaft in the column. On the upper end of this shaft is a pulley which, through idlers, drives the pulley on the main spindle of the carrying head, the idlers being so attached that the head may be swiveled at any angle up to 90°, and for exact adjustment the table is accurately graduated to half degrees. This machine is thoroughly well built of suitable materials, and all bearings are protected by dust proof boxes. Two heads are provided, one with strong spindle for carrying large wheel and one for high speed small wheels, as used for inside grinding. The speeds are well proportioned for economical grinding, and with the automatic traverse the machine is desirable for grinding circular dies and triblets for tubes.

The capacity of the machine may be summed up about as follows:

Largest cylinder which can be ground, 12 inches in diameter, 10 inches long. Will grind 16-inch hole in ring to a depth of 4 inches. Will surface a disk 18 inches in diameter.

Duluth News.

At the Mountain Iron Mine, on the Mesaba, an immense amount of work is being done in steam shovel stripping for the shipping season of 1894. Five large and powerful steam shovels are at work day and night, and four standard gauge and six dummy locomotives are employed. Though the temperature has already touched 36° below zero, the only serious inconvenience has been the stiffening up of the machinery. Owing to deep snows there is but about a foot of frost in the ground, and this readily breaks down under the shovels. Frost has made a little trouble on the sides of cuttings exposed for several days to the weather. It has been plainly demonstrated that even in this climate surface work, so far as men and material are concerned, can be successfully carried on in the coldest weather. Trouble with machinery, however, adds much to this winter work. It is hoped to strip about 500,000 yards of surface at this property before spring, there being an average of 20 feet in depth over the ore. As this is the first fair test of winter work in these surface mines, either for work done or price, it is of very considerable importance.

At the Biwabik also about 500,000 yards are being moved, no machinery being used. By January 500 men will be at work. The conditions here are so different from those at the above mine that one is no guide to the other.

The Oliver is so arranged that no winter work need be done. These three are at present all the "steam shovel mines" on the Mesaba, though the remarks of Chairman Wilson of the Tariff

Committee would lead one to suppose there was nothing but this class of mines in the range. Surely at such a mine as the Biwabik, where 500 men are at work, the question of "natural labor" would appear to be "relevant."

Contractors and engineers are examining the Minnesota Iron Company's new Mesaba purchase, the Iron King, where over 300,000 yards of stripping are to be moved at once. The Norman, another Minnesota Iron Company purchase, is also to be stripped in a moderate way. During the past week the Minnesota have added another to their list of Mesaba properties by securing 240 acres near the McKinley on payment of \$50,000 and agreeing to a 30-cent per ton lease. The Minnesota are now second only to the Consolidated in their Mesaba holdings.

The Franklin, probably the best underground mine in the new range so far, and the Diamond, both closed last week. They discharged 400 men.

On the Vermillion range range the Minnesota is hoisting 2000 tons and the Chandler about 1500 daily. This company's Canton mine, Mesaba, in 11 consecutive days mined and hoisted 6000 tons, working 135 men all told.

At the Gogebic range towns of Ironwood, Hurley, Bessemer and Wakefield there are respectively 3200, 2100, 750 and 600 persons who are absolutely dependent upon charity, and will continue so to be till work is given them. Two mines at Ironwood have started up in the week, and several more may do so; all, however, in a very small way.

At New Philadelphia, Ohio, there is considerable activity during these otherwise dull times. The New Philadelphia Wire Nail Company are running double turn, employing about 150 hands, and are turning out an average of 1100 kegs per day. The New Philadelphia Iron & Steel Company are operating their sheet mills about half time, the orders being for roofing sheets and galvanizing stock. The Spicer Mfg. Company of the same place are pushing their line of rolling mill machinery and labor saving appliances and are kept fairly busy. At Canal Dover, three miles north, in the Tuscarawas Valley, the Reeves Iron Company are operating their bar mills and sheet mills to about two-thirds their capacity. Large orders for car roofing sheets recently entered by the last named company will probably furnish the nucleus of steady work for months to come. The blast furnace of the Penn Iron & Coal Company, Canal Dover, stands as a silent monument of dull times, and there appears to be no prospect of immediate resumption. Ripple & King are running their foundry and machine shop little more than half time, and other industries are quiet. At Cambridge, Ohio, 40 miles south, the Cambridge Iron & Steel Company are operating three out of four sheet mills and two galvanizing pots. The Cambridge Roofing Company and the Cambridge Corrugating Company are not working more than half time. The various roofing concerns at Canton are all working a small force of men part time.

The garbage disposal question has been settled in Chicago by the signing of a contract with a garbage reduction company, who will at once erect five crematories, each of 100 tons daily capacity, at a cost to the city of \$25,000 for every crematory built.

The Western Foundrymen's Association.

The regular monthly meeting of the Western Foundrymen's Association was held at Chicago on Wednesday evening, December 20, 1893, President Sargent in the chair. The following amendment to Article 8 of the by laws was presented and adopted:

"ARTICLE VIII. — All proposals for membership shall be made in open meeting by any member. The application, with the indorsement of the member making the proposition, shall be voted upon by the members present, a majority electing."

The secretary read a paper entitled

Furnace vs. Foundry Practice

by E. A. Wheeler, Sharon, Pa.

Pig iron contains about 94 per cent. of pure iron; the other 6 per cent. is chiefly composed of carbon, silicon, manganese, phosphorus and sulphur, and upon the proportion of these elements depends the quality of the iron. Through the aid of chemistry we have learned in what proportion these ingredients should be contained in the pig iron in order to make the best iron, steel or castings. Carbon and silicon are indispensable elements, but phosphorus and sulphur are rank poison, and should be eliminated as much as possible. The furnace operator knows how hard it is to make iron containing the right proportion of carbon and silicon. Although the ores, coke and limestone are carefully weighed into the furnace, the hot blast is held at the same temperature and all the conditions are the same as near as possible, yet we seldom get two casts alike, as the following report of one day's work of six casts at our furnace will show:

	Silicon.	Sulphur.
First cast.....	2.28	0.013
Second cast.....	2.43	0.009
Third cast.....	2.40	0.010
Fourth cast.....	2.00	0.020
Fifth cast.....	1.94	0.035
Sixth cast.....	2.04	0.024

You will see from the above analyses the constant change that is going on in the furnace, and, although the iron was No. 1 in grade, and no difference could be noticed in the fracture, yet it would work very different in foundry castings. This explains why furnacemen sometimes get letters from their customers which read about as follows:

"The last car of iron you sent us is not good; can't use it; plates crack, and the castings are too hard to work in lathe, and it spoiled our last heat."

Now, a little knowledge of chemistry would have saved all this trouble. The last car was too high in carbon and too low in silicon. Had the foundryman said in his order, "Ship me one car of iron, same as last, silicon 2 or 3 per cent.," as the case may be, he would have had the same castings as before, with the same mixture, and no uncertainty about it. Or had he known that the iron was low in silicon, and added a little high silicon pig iron, he would still have been all right. The fact is that silicon plays so important a part in regulating the carbon in iron that no well regulated foundryman can afford to use iron without knowing how much silicon it contains; and with that knowledge he can always have the kind of iron he wants in his castings. Too much silicon makes iron weak and too little makes the iron hard. Good castings for machine work should contain

from 2 to 2½ per cent. of silicon; stove plate, 2½ to 3 per cent. If the foundryman will keep on hand a stock of silvery gray iron running 5 per cent. in silicon and knows what his strong irons run in silicon, as he always should know when he buys his iron, he can easily make a correct mixture in the office and not depend upon his wizard mixture for the quality of his iron. Every foundryman should keep his own chemist, or buy his iron on analysis and demand a chemist's card with each car. If this rule is observed, Nos. 2 and 3 and even gray forge can be used and very much cheapen the stock and make equally good castings. The puddling furnace must go, as soft steel is rapidly taking the place of iron, and then the white and mottled iron will have to be melted over in the blast furnace. Forge irons will have to be used in the foundry, and there will be no trouble in doing so, provided you have the correct analyses of the iron and use the right amount of silicon in each charge in the cupola.

The quality of the iron in the blast furnace is governed by the temperature. If the furnace is hot the silicon runs up and the sulphur down; if the furnace is cold the silicon runs down and the sulphur takes its place and we get No. 3, or may be white and mottled iron. I would think a hot or cold cupola would have the same effect on the iron. If the cupola is hot the iron will take up carbon and silicon from the coke and the castings will be soft and good; but if the cupola is cold the iron will take up sulphur and the castings will be hard and poor.

There are so many contingencies connected with the operation of the cupola that it is hardly safe to make any suggestions without knowing all the conditions. The first question is the quality of the coke. If the coke is poor and full of sulphur you cannot get good castings. A great deal depends upon the blast, whether soft or strong. My impression is that most foundrymen use too strong a blast and melt the iron at too high a zone. A soft blast will take a little longer to take off a heat, but there will be great economy in coke and less oxidizing and a better quality of iron when melted. It is very important to use the right percentage of lime for flux, as it purifies the iron and covers it with slag and keeps it hot and prevents oxidizing. Forty years ago the writer was engaged in the foundry business making stoves, and although all other branches of the iron and steel business have been revolutionized, the foundry business seems to plod along in the same old rut, and is governed by the rule of cut and try, and I cannot see that there has been any improvement. Iron is still sold by the fracture and graded Nos. 1, 2 and 3, and silvery gray for a softener.

The foundryman should know how much silicon and sulphur each number contains. I notice your association is talking of one chemist to do the work for all the foundries. That plan will not work, as most of the foundries do not order iron until they want to use it, and often say in the order to ship quick and send tracer to hurry it along. How could they wait to send drillings, perhaps hundreds of miles, and then wait their turn for the analyses? That is too slow even for the average foundryman. All pig iron for making steel, either Bessemer or open hearth, is sold on analysis, and why should not foundries adopt the same rule? For years we have analyzed every cast at our furnace for silicon and sulphur, and once a day

for phosphorus. Each cast is piled by itself and the date and number of the cast is marked thereon, and by referring to our chemist's book we know just what it is and would be glad to send any one buying iron the correct analysis with each car we ship. A prominent steel man once said to the writer: "I don't care what your iron is made of so it has the correct analysis. I don't care if you make it from all mill cinder." He knew very well that the analysis would not be correct if made from cinder, and so with the foundry; you can depend upon the iron if the analysis is correct.

The writer, when in England a few years ago, was shown through a large foundry and saw an attachment to an ordinary cupola, which seemed to be a good arrangement, and was new to him. It consisted of a square brick bosh inclosed in cast plates to bind it, with an arch roof over the top and high enough to take in the tap hole or trough from the cupola, and was large enough to hold the entire heat that was wanted. The bosh had a hole through the arch tap near the front and a gas flue about 8 inches in diameter leading from into the cupola, say half way up the side, to carry off the gases. The operation was as follows: When the cupola was fitted up the bottom was so arranged that the iron and slag as it melted all ran to the tap hole, and as it was left open and quite large, of course it went into the bosh, which had been well dried out and heated up before the blast was put on, and the blast would pour a large stream of burning gas into the bosh with the iron and slag and keep the iron hot. The practice was to melt the entire heat before commencing to tap out of the bosh for use. I was told by the foreman that this was a great improvement over the old way. First, the iron was homogeneous and the quality was improved, and as the iron was covered with slag it would keep hot enough for use for at least two hours, and then when you commence casting there was no delay waiting for iron, as the melting was all done before the molders quit work. There was one cramp in the arch top such as is used on the neck of a puddling furnace that could be lifted off to get in to repair or start a fire to dry out and heat it up. The whole thing was so simple and inexpensive that I think any one could build such an attachment to his cupola from the description I have given, and if I were in the foundry business I should certainly try it. I inquired of the foreman if such an arrangement were common, and he said not; that it was a trade secret, and other foundrymen were not allowed to go through their works.

It is a well known fact that every time you melt iron in a cupola you deteriorate its grade and you have to use new high silicon iron when melting again to replace the silicon burned out in melting. In a blast furnace it is just the reverse. We can take white and mottled iron or old burned hot blast pipes and grate bars and melt them over and the whole thing will come out good gray iron if the furnace is working well, and it melts well and seems to improve the working of the furnace. If fed in the furnace at the rate of 5 or 10 per cent. of the stock used it will not require any more fuel than if it was not used. I do not see why a cupola could not be constructed, something after the lines of a blast furnace, that would convert old hard scrap into good, soft, merchantable iron.

The cupola would have to be, perhaps, 15 feet high, and have a closed top so as to conduct the waste gases down into a small hot blast, and if the blast can be heated up to 900° it will do the work. A little lean ore high in silicon might be required with the lime to make sufficient slag. I think it would pay some firm who have plenty of means to experiment in this line.

Supplemental Hints for Foundrymen.

Always melt your iron hot and draw it off about as fast as melted and cool in ladle, otherwise you burn out the silicon. Do not try to save coke at the expense of the quality of your iron.

Always get the correct analyses for silicon with each car of iron you buy. Get the card of the chemist who made the analysis, with his signature, to be sure that the analysis is correct.

Silicon governs the quality of the iron in all cases, unless the iron contains over 1 per cent. of manganese. Manganese makes the iron hard.

The price of all foundry iron should be governed by the per cent. of silicon that it contains. The higher the silicon the more valuable the iron, because the more scrap it will carry.

Foundrymen often pay very high prices for strong pig. If they will take the common scrap about their foundries and mix enough high silicon pig with it to make the castings contain $1\frac{1}{2}$ to $1\frac{3}{4}$ per cent. silicon, they will find that they have a very strong casting.

Stove plate should contain $2\frac{1}{2}$ to 3 per cent. of silicon.

Machine castings, to work soft, should contain $1\frac{1}{2}$ to 2 per cent. of silicon.

Machine castings hard and strong to stand wear and friction should contain $1\frac{1}{2}$ to $1\frac{3}{4}$ per cent. of silicon.

Castings containing 1 per cent. of silicon or under work hard and flinty under the tool, and are only fit for plow castings or chilling purposes.

Add one-fourth of 1 per cent. more silicon in your mixture than you want in the castings for loss in melting.

If your iron is too high in combined carbon, and too hard, add more silicon.

If your iron is very gray and soft, and high in graphitic carbon, and runs sluggish, add silicon.

If your iron is too soft and weak for your purpose, reduce the silicon.

W. D. Sargent: How about the next to the last hint? It seems to me that it contradicts the one preceding it. He prescribes the same remedy for exactly opposite conditions.

Mr. Hollis: I do not think I agree entirely with Mr. Wheeler in the amount of silicon which he prescribes for the different kinds of working.

Mr. Sargent: There is the question of obtaining the analyses. Is it very difficult to obtain the analyses signed by a chemist?

Mr. Sargent: I think most furnaces have each cast analyzed. It is easily done. The Illinois Steel Company grade every car in that way. I think a great many furnaces do it.

Mr. Sercomb: I think every furnace company will furnish an analysis.

Mr. Hollis: I think the value of such grading depends upon the furnace piling each cast separately at a time. Unless it is done in that way the analyses would be of little value.

Mr. Sargent: What will be the variation between the grades of iron as to the silicon?

Mr. Hollis: Sometimes there will not be any. The grade of the iron in a general way shows the silicon contained.

Mr. Sargent: It would not then be possible to follow out Mr. Wheeler's idea and grade iron by the silicon?

Mr. Hollis: The grade of the iron does not mean necessarily the silicon contained.

Mr. Moore: The steel furnaces grade their iron according to analysis rather than fracture. It has been my experience that we have had No. 3 iron show higher silicon than some iron that we would grade No. 2. It seems to me in looking over the paper that the author places a little undue stress upon the silicon and ignores somewhat the sulphur, which is certainly as important a factor in the fracture and also in affecting the working in the iron in melting, and afterward the character of it right through.

Mr. Hollis: In regard to the point that the last gentleman raised, that No. 3 iron sometimes gets higher silicon than No. 2, I would say that the physical conditions in which it is cast would largely affect the grade. Anything that would chill the iron quickly in the pig bed would lower the grade. That would account for No. 3 iron having higher silicon than the higher grade.

Mr. Moore: Is it not a fact that taking two grades of iron, say 2 and 3, the difference in fracture is due to either one of these two causes—the physical conditions at the time of the cast or the presence of sulphur?

Mr. Hollis: I think not. I think the sulphur by itself could not account for that difference in the fracture of the iron, but the high sulphur almost invariably accompanies a cold working in the furnace, and such conditions give a low silicon iron, and a closer fracture, closer grain.

Mr. Sercomb: Is it not a fact that in the last year and a half, since there has been an endeavor to sell iron on analysis, it has been somewhat of a failure? The foundries may purchase the iron with a guarantee that there is a certain amount of silicon. You are depending upon some chemist who may make a mistake, and the different conditions of the cupola would cause the different fractures in the different irons, as regards softness or hardness, and you make the complaint to the furnace that the iron is not as it should be, and there is no redress. I believe the foundryman will have to make a study of these analyses and experiment quite a little before he becomes thoroughly versed in the matter. If in the different casts there is such a great variation there would have to be a large number of pigs drilled to get the exact analyses; then it does not seem much work saved, for to-day when you want to buy pigs they will break every one for you.

Mr. Hollis: I think it is common with most blast furnaces to take a sample out of the first third and then another out of the second third, and so on, and then use this as a sample for the cast, which in almost every case would fairly represent the cast.

The President: Do you think it advisable to purchase iron by the percentage, having it guaranteed, rather than by the number?

Mr. Hollis: I think most decidedly so. A sample of cast or pig iron can be taken while running out of the pig beds.

Mr. Sercomb: How would you account for iron that you had used for a year and a half with perfect satisfaction in every respect, so that you would adopt it, and then you would make a purchase of 500 tons that was in such a condition that you were not able to use

it at all? It was the same iron as far as I was able to see, yet the iron ran to that degree of hardness that it had to be rejected.

Mr. Moore: I presume that most of the foundrymen have had somewhat the same experience. The old reliable casts fail us at times. We had an experience with hard iron during the past year that was quite an expensive one, and we got in quite deep before we knew it. The question was, where was the trouble. It was in several grades of iron and we started at once to ferret the thing out. We started to analyze our iron. We had been getting in some new iron. We could find no trouble in the iron. We then took up the coke, which we thought was all right. We found the coke to be running from 1 per cent. to $1\frac{1}{2}$ in sulphur, and that was "the nigger in the wood pile."

Mr. Sercomb: I would say that we changed our coke and then went back to the same coke again. We found that we would have to change our iron. We then tried Ashland iron and then went right for a while, but pretty soon that became as hard as flint and we had to reject that.

Mr. Moore: I have understood that that condition in the casting is liable to be produced by a high manganese. I would like to hear an expression of opinion.

Mr. Sercomb: I have talked with many foundrymen and no one could give me an explanation of the trouble.

Mr. Sargent: We have used manganese iron and never had any trouble.

Mr. Moore: How high?

Mr. Sargent: As high as 3 or 4 per cent.

Mr. Sargent: I would like to ask if any one can tell what the percentage of silicon to the shrinkage is.

Mr. Hollis: I think you will find that information in a paper by Mr. Keep in the "Transactions" of the Mining Engineers. It is not in direct ratio, as I would call it, up to a certain point. I do not recall the percentage enough to tell it.

Mr. Sercomb: In the matter of analyses has it not been somewhat of a failure?

Mr. Hollis: I think not when analyses are properly applied. The way in which the majority of foundrymen have used them they have been worse than useless. The trouble has principally been that no attention whatever has been paid to sampling. For instance, a foundryman will have some trouble and go out to his stockyard and take up one piece of iron, it may be an odd pig, and take that for the analysis of the whole, instead of systematically going through his pile and taking a large number of pigs. The same thing is true in the way coke is sometimes analyzed. They will take one piece, which as a rule is far from being an average sample. If they would pay more attention to the sampling I think they would get better results.

Mr. Moore: What do you consider a fair sampling of a car, how many pieces?

Mr. Hollis: I think that would depend largely upon the appearance of the iron. If the fracture indicated a variety, it might be 20 or it might be 25 or more. If it were fairly uniform it would be only five or six, possibly eight or ten, unless you should know that it was a single cast.

Mr. Moore: Most cars are from single cast.

Mr. Sargent: According to Mr. Wheeler it is a very simple thing to follow an analysis and get what you

want. If Mr. Wheeler is correct it seems to me that the foundry business is far more simple than we had supposed.

Mr. Hollis: I hardly think that the matter is quite as simple as you say. Given a certain brand of iron in which the phosphorus is fairly uniform, then what Mr. Wheeler says is largely correct. The phosphorus, manganese and silicon being uniform, the ratio of combined carbon, which determines the physical properties of that iron, is largely dependent upon the silicon or accompanies the silicon.

Mr. Sargent: Too much stress has been put upon the value of silicon alone as a regulator of cast iron. I am quite certain that the silicon can be all right; in fact, we have made castings that were hard with the silicon $3\frac{1}{2}$ per cent., which is altogether too high, I think, in proportion. We knew at the same time that our sulphur was running from 0.08 to 0.09 or 0.10. There was no question but that the silicon was high enough.

Mr. Hollis: I think there is no question that when you get beyond a certain point with silicon you begin to harden your iron. When you have $3\frac{1}{2}$ per cent. in your iron, all things being equal, you have a little harder iron perhaps. There is a limit in which it is well to have the silicon.

Mr. Moore: You then consider that sulphur is not an important factor?

Mr. Hollis: The sulphur by itself is not. It is chemical properties that usually accompany high sulphur that are detrimental; high sulphur goes with a cold working furnace, low silicon and white iron.

Mr. Moore: In the case I mentioned the sulphur and silicon were both high and the iron in a normal condition.

Mr. Hollis: I think that is exceptional.

Mr. Moore: The one point in that paper which is of benefit to foundrymen is the endeavoring to do the thing by rule, and that is the loss of silicon in melting. It is a question in which we are all at sea. I am interested to know whether the statement that it is about one fourth of 1 per cent. is to be taken as reliable or not. It would be very interesting to have that statement substantiated. My impression has been that it was considerably larger. I presume that would vary somewhat according to the condition of the cupola.

Mr. Sargent: It is somewhat difficult to figure the loss of silicon while you run through two or three different mixtures.

Mr. Moore: I mean with a standard mixture. Of course it would be a very complicated thing if the mixture was varied during the heat.

Mr. Hollis: I should think Mr. Wheeler meant other things being equal. There is no question but that the loss in silicon is largely dependent upon the working of the cupola.

Mr. Moore: What, in your judgment, would be the conditions that would produce the greatest loss in silicon?

Mr. Hollis: With what kind of mixture? Running average mixture with the 2 per cent. silicon I think cold working, other things being the same.

Mr. Moore: The cupola running cold?

Mr. Hollis: I would answer that question in another way. The hotter the iron the greater the tendency to absorb and keep the silicon.

Mr. Moore: What is the possibility of the iron taking up some silicon in the cupola?

Mr. Hollis: I cannot conceive of such a case. I can conceive of the cupola running hot enough to develop the same. The hotter the furnace the higher the silicon.

Mr. Sargent: I would suggest that it would be a good plan for the members who are getting analyses to make an attempt to determine the loss of silicon. It is the one basis on which proper results can be obtained.

The following resolution was then adopted:

Resolved, That the association offers a vote of thanks to Mr. Wheeler for the excellent paper he has presented.

The meeting then adjourned until the third Wednesday in January.

Notes of a Southern Trip.

Among the Alabama furnaces there are in blast: Three DeBardeleben, at Bessemer, two Ensley, two Sloss, one Pioneer, one Woodward and Etowah, and out of blast two DeBardeleben at Bessemer, two DeBardeleben at Oxmoor, two Ensley, two Sloss, one Woodward, two Alice, Mary Pratt, Williamson, Vanderbilt, Trussville and two Woodstock, at Anniston. The furnace practice in the Birmingham district has been greatly improved of late. The product is much greater and percentage of foundry grades is much larger.

Mr. DeBardeleben is giving his entire attention to making iron at Bessemer and Ensley and wonderful changes have been made during the past two months. A laboratory has been fitted up at Ensley under the charge of Dr. Phillips and daily analyses are made. Iron is now graded by analysis as well as by fracture, and the latest scientific method has been introduced. If the determination for silicon of a cast of iron shows that the fracture does not indicate its proper grade, it is graded according to its analyses.

The increase in production is remarkable. One Ensley furnace has made 212 tons in 24 hours, and the two in operation are now making about 375 tons daily, nearly all foundry iron. One of the furnaces at Bessemer is making over 190 tons daily, and all three are doing better than ever before. They have not had enough No. 3 foundry and gray forge, and have been trying to make those grades at one of the furnaces, but the output continues largely Nos. 1 and 2 foundry. The iron is graded very high, is strong and soft and should be capable of use in almost any mixture where strength and softness are required.

The Sloss Company have one furnace blowing at Birmingham and one at North Birmingham. They have sold 17 000 tons gray forge in the last two and one-half months. Recently they sold 5000 tons to be put on leased land and held for investments. They say that they will have to take iron from warrant yard for this purpose. If two deals now pending for 5000 tons are made it will sell their gray forge and F. F. for two or three months ahead. None of the furnacemen are sanguine about an early improvement and are disposed to sell current output at current prices. They recognize, however, that a decided increase in demand would create a scarcity and they wish deliveries restricted within reasonable limits.

Many American manufacturers are preparing their exhibits for the international exposition that is to open in Antwerp, Belgium, next May.

The Kansas City Implement Trade.

An interesting meeting of the Kansas City Implement and Vehicle Association was held in that city on the 18th inst. W. P. Yancy read a paper on "How to Prevent an Accumulation of Old Stock." He advised that the buyer should study crop conditions and market values in the various sections of the territory covered, and that the salesman give special attention to any line of goods that shows a tendency to accumulate. He advised that the jobber never overload a regular customer, and that cutting of prices never be resorted to in order to get rid of goods. He closed by commending to the attention of the club the old adage that "goods well bought are half sold."

M. H. Lohsee read a paper on "Express Rates." He showed the great discrepancy between railroad and express rates and cited the following rates by rail and express respectively between this city and other cities: To New York, railroad \$1.35, express \$4.50; Pittsburgh, \$1.08 and \$3.50; Chicago, 75 cents and \$2; Omaha, 40 cents and \$1.50; Minneapolis, 80 cents and \$2.75; New Orleans, \$1.25 and \$4.50, the average proportion of freight and express rates being 3 to 1 against express rates. Mr. Lohsee said that the State legislatures had not paid much attention to express companies, which had gone unnoticed in comparison with the great railroads. The express companies, though owning no tangible assets, yet declare fancy dividends on fancy stocks. He declared it was time some effort was made to readjust the exorbitant express rates charged.

O. V. Dodge read a paper on the Interstate Commerce law in its relation to the implement trade. He declared that the law was a practical failure and that the railroads, from whom it was intended to protect the people, were the real beneficiaries, being enabled to maintain high rates because the law prohibited any deviation from published tariffs. He declared that railroads preferred national supervision to interference by State legislatures, and that the railroads were always the victors in suits brought for violations of the law. He closed by advocating an effort to secure 5000-mile tickets good over any road at 2 cents per mile.

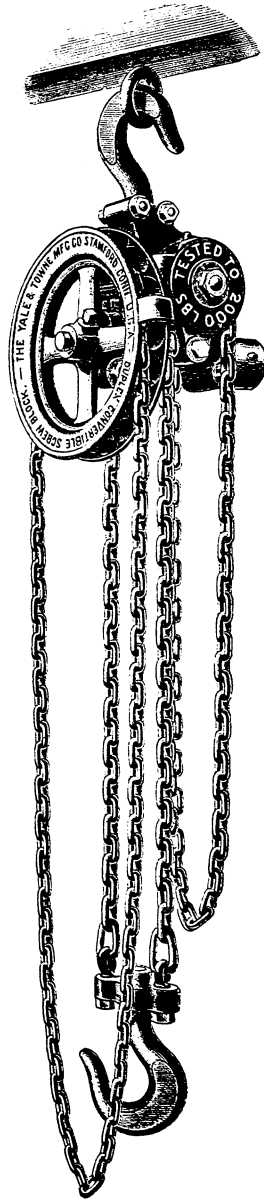
H. C. Taylor of Lyons, Kan., read a paper showing the effect of the recent ruling of the Kansas Board of Railroad Commissioners reducing the carload rate on implements from this city to Wichita and from Wichita to all points in Kansas from 32½ cents to 28½ cents. The through rate from Chicago to Wichita is 2½ cents less than the sum of the locals. The carload rate on cultivators from Mississippi River points to Wichita makes a difference of \$1.60 against the Kansas City jobber on every binder sold; \$1.34 on every buggy, or \$64 and \$53 on each carload respectively. He gave many other figures showing that Wichita is given an immense advantage over Kansas city and is taking away the trade that naturally belongs to the latter.

Mr. Taylor fully explained the Kansas law, which provides that any city can secure reductions in freight rates on the application of the Mayor and council to the commissioners on petition of 25 citizens. If the Mayor and council refuse to make the application on petition of the citizens, the commissioners may take the matter up on petition of the citizens, but cannot do so of their own motion. After considerable discussion the matter was referred to the Legisla-

tion Committee. At the conclusion of the programme President Stowe admonished the members to prepare for a discussion of the new tariff bill in its relations to the implement trade with Canada at the next meeting. The present tariff is 35 per cent., which is taken off in the new bill, enabling the Canadians to duplicate implements of his company at greatly decreased prices, owing to the cheap labor employed.

Duplex Convertible Screw Block.

The accompanying illustration shows the latest addition to the line of chain blocks made by the Yale & Towne



Duplex Convertible Screw Block.

Mfg. Company of Stamford, Conn. As indicated by its name, the leverage by which the hoisting capacity is obtained is that of a screw motion or, more properly, a worm and worm wheel motion. The construction is such as to permit a much higher efficiency to be obtained than is practicable with an ordinary worm wheel motion, and the device by which the load is sustained, and which acts in conjunction with the worm, is capable of conversion at the will of the operator so that a dispatch lowering action may be obtained when so desired.

As shown in the engraving, the new block is neat in appearance, the worm wheel being placed between the two chain sheaves and all the parts symmetrically disposed. The worm and worm wheel motion, as well as the device for sustaining the load, are all inclosed in an oil tight casing, thus insuring thorough and continuous lubrication of the working parts, and preventing the entrance of dust and grit. The two hoisting chains are attached at their lower ends to a yoke to which the hook is secured, each chain having a swivel connection so that kinking or entanglement of chains is impossible. The block is light in weight, convenient in operation, and possesses a high degree of efficiency, standing both in cost and efficiency midway between the differential and triplex blocks. The sustaining feature is obtained by means of a friction plug which receives the end thrust of the worm shaft. The friction of the end of the shaft upon this plug furnishes sufficient resistance to prevent the running down of the load and hence lowering must be effected by pulling on the hand chain.

The most notable point of the block is the convertible feature by means of which the change from safety to dispatch lowering may be made. The convertible feature is arranged as follows: The load hanging upon the hook causes an end thrust upon the worm shaft, and this thrust is received by a plug screwed into the casing of the block and pinned through to prevent rotation. By backing out the pin the cap may be removed and the plug taken out and reversed. The end of the plug which is in contact with the worm shaft is formed so that the bearing is upon an annular or ring surface at the circumference of the end of the plug, and hence the distance from the center at which the friction acts to retard the rotation of the shaft is great enough to keep the load from running down. Under these conditions the load will only continue to descend so long as the hand chain is operated, this constituting the safety lowering arrangement. If, however, the user desires dispatch lowering, he unscrews and reverses the plug so that the end thrust is taken by the reduced end. With this arrangement the load will continue to descend after it has once started, and in this manner the block can be converted from safety to dispatch lowering. This construction enables the user to decide which form he desires, and the block can at once be set for either function, after which no change need be made until the block is transferred to some other line of work for which a reconversion may be desired. The dispatch lowering is especially convenient for bridge works and for many situations in which it is desirable for the operator to stand clear of the load.

The fact having been noised abroad that the municipality of Pittsburgh are giving work to the indigent of that city, an influx of the unemployed from all parts of Western Pennsylvania into Pittsburgh is taking place. As it is all the city can do to take care of its own, the line of relief has had to be drawn very closely.

Consequent on the opening of the Manchester Ship Canal, the city of Manchester, having become a seaport of the United Kingdom, has received a warrant making it a port for customs purposes from January 1. The Admiralty have also assumed Jurisdiction of the port.

The Chicago Horse Shoe Company.

The Chicago Horse Shoe Company are now running their plant regularly, turning out standard horse and mule shoes. The works, which are located at East Chicago, just outside of the city limits, were founded some four years since, but owing to a combination of adverse circumstances the company have but recently begun to supply the trade with their products. During the interval the management of the company has changed completely, and the control has passed into the hands of practical business men, thoroughly acquainted with the peculiarities of the horseshoe business and expert in manufacturing details.

The plant as it now stands is entirely new, all the machinery having been perfected and installed by the present managers. It has been satisfactorily tested in making up a large amount of shoes for stock, which are pronounced by experts to be of a character to meet the exacting requirements of critical consumers. The location of the works on the line of the Pittsburgh, Fort Wayne & Chicago, the Belt Line and the Chicago and the Calumet Terminal railroads affords all the facilities that could be desired for prompt shipment in any direction, as the two last named roads connect with every line running into Chicago. The ground occupied comprises 8 acres, which gives the company ample space for future extension. The principal building is a large structure in the form of an L, the main part of which is 165 by 90 feet, and the wing 90 by 64 feet. Detached from the main building is the boiler house, a brick building with a metal roof, containing a battery of four 16-foot tubular boilers. The machinery consists of a complete outfit of Goodenough horseshoe machines, six machines for making flat shoes, two trains of rolls for rolling horseshoe bar, power shears, forges, large and small heating furnaces, and a complete machine shop with lathes, drill presses, planers, &c. The motive power is supplied by eight engines of 1000 horse-power in the aggregate. All the special machinery has been built on the ground, in the company's own shops, and embodies numerous special devices which have been suggested by the combined experience of the managers of the company. No expense has been spared in securing the best appliances to accomplish the most perfect results. The equipment of the machine shop is superior to that usually found in establishments not making a specialty of machinery. Among the peculiar features of the processes employed may be mentioned the creasing of the bars in their last passage through the rolls, which is thus done with unflinching accuracy, and the imparting of a perfectly smooth surface to the finished shoe, which is done by the last machine through which the shoes pass.

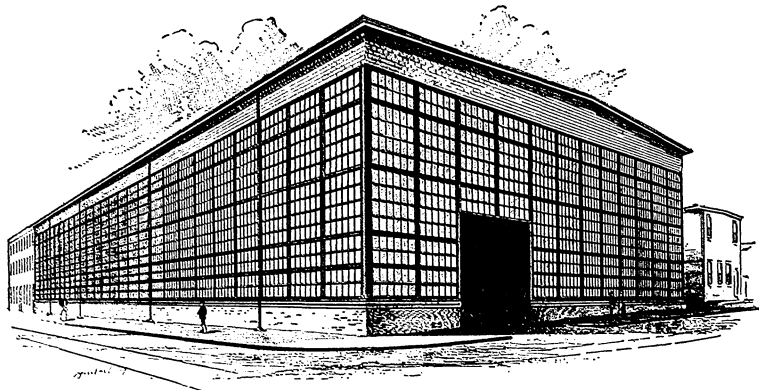
The managers of the company lay particular stress on the fact that they are engaged in producing nothing but shoes. Dealing exclusively with one product, they can concentrate their energy on its peculiarities and anticipate improvements which the progress of the times may cause consumers to demand.

They further have the distinction of being the first exclusively horseshoe manufacturers to get into regular operation in the West. They are not only

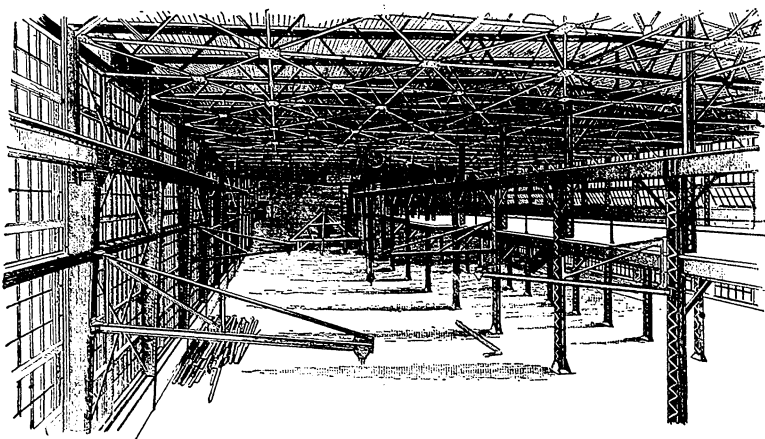
located at the gate of the most desirable market in the country, reaching all the great Western jobbing centers at low rates of freight, but gain peculiar advantages in the low cost of scrap and the cheapness of fuel. Oil is at present exclusively used for fuel in raising steam and operating the heating furnaces and forges, at very much lower cost than coal. The oil is piped from the Standard Oil Company's main line into a storage tank. It flows thence into a smaller tank underground, from which it is pumped through a stand pipe to the points of consumption to secure a uniform pressure. A complete gas producing plant has, however, been erected, which is ready for use at any time if oil should become too ex-

Shops of the Fuller Iron Works.

The new machine shop for the Fuller Iron Works, at Providence, R. I., is now completed. The building is 90 feet in width, and in order to secure good light for the interior it was found necessary to either use skylights in the roof or to adopt some other construction besides brick in the sides of the building, as the brick walls obstruct the light to such an extent that the center of the building would be very badly lighted on a dark and cloudy day. To obviate this trouble the patented construction of the Berlin Iron Bridge Company of East Berlin, Conn.,



Exterior.



Interior.

SHOPS OF THE FULLER IRON WORKS.

pensive. A natural gas pipe line runs in the immediate vicinity and the coal fields of Indiana are within easy reach. The fuel question is, therefore, pretty completely covered.

The capacity of the works is from 500 to 600 kegs of horse and mule shoes per working day. Plans have been prepared for additional buildings and the duplication of the machinery now in use, which will be put in execution during the coming year. The company manufacture steel as well as iron shoes, so as to meet the demand for steel shoes which is rapidly becoming a feature of the horseshoe trade.

The main office of the company is in the Ashland Block, room 908, corner of Clark and Randolph streets, Chicago. The president of the company is G. N. Caleb; vice-president, William Poillon; treasurer, Walter S. Caleb; secretary, E. A. Schwarzenberg. These officers together with Hon. William A. Vincent compose the Board of Directors.

was adopted. The sides of the building are almost entirely of glass, with steel posts only obstructing the light. These glass sash are so arranged as to swing, thus allowing complete ventilation in all kinds of weather. The plan commends itself for cotton mills, woolen mills, and that class of construction, where the width is excessive and the height between joints is limited. It is almost impossible to light any building of over 60 feet in width unless skylights are used in the roof, and the objection to them is that they leak, either in the skylight itself or in the connection between the skylight and the roof. The main shop of the above building is 50 feet in width and 200 feet in length. A traveling crane controls the entire length of this portion of the building, and it is made of sufficient height so that machinery of all kinds can be set up under it. The floor spaces in the immediate vicinity of all machines are also con-

trolled by jib cranes operated by two hands, thus bringing the floor space in the immediate vicinity of the machine under the full control of the operator. The lean-to or wing is 40 feet in width and 142 feet in length. This is made two stories in height, the upper story being used for light work, the lower floor being controlled by jib cranes secured to the columns so that heavy work can be moved in and out from the central portion of the building.

NEW PUBLICATIONS.

SUBJECT MATTER INDEX OF TECHNICAL AND SCIENTIFIC PERIODICALS. Compiled by Dr. Rieth, for 1892. Published by C. Heymann, Berlin; B. Westerman & Co., New York.

Under orders of the German Patent Office Dr. Rieth compiles annually an index of the articles printed in the leading technical and scientific journals of the principal countries. The titles are given in the language in which the article was printed. Throughout the typography is clear and the editing exceedingly careful. In its way it is probably the best yet published and will prove exceedingly useful to those who are familiar with the German language.

SMOKE ABATEMENT IN ST. LOUIS.

The Smoke Commission of the City of St. Louis, which has done such admirable work in the past, has printed two brief reports in pamphlet form, of which the first is a report made concerning a canvass of the manufacturing establishments of St. Louis, with special reference to their compliance with the city ordinance. They have studied the boiler plants in the city, and insist that with certain exceptions means could be employed to avoid the smoke nuisance. Among the exceptions are the boiler plants of iron and steel manufacturing establishments. The same report embodies a draft for a general standard for testing smoke abatement devices.

Under the instructions of the ordinance, tests must be made of the different devices submitted for the prevention of smoke. A special report, issued in October, deals with the Boileau device submitted for test by the Improved Zigzag Grate Bar & Smoke Preventing Company. The commission summarizes its conclusions by stating that up to 25 pounds of coal consumed per hour per square foot of grate area the Boileau device is capable of reducing the average smoke emission 90 per cent., or to an average smoke emission within a limit of 10 per cent. of smoke, if proper care and attention be given it. They state that an increase in boiler capacity up to 15 per cent. above rating can be obtained without endangering the smoke record, but except in those cases where such an increase in capacity results in a money saving there will be no direct return on the investment, which must be charged to improvements required by the smoke suppression ordinance.

GEOLOGICAL SURVEY OF NEW JERSEY. Annual Report of the State Geologist for the year 1892. Trenton, N. J.

The character and scope of Professor Smock's annual report have become sufficiently familiar to those interested in geological work to allow us to state that he has added another volume of great interest to the series. Practically the report for 1892 deals with a num-

ber of different branches, the first part taking up surface geology, with special reference to the influences of the glacial period. Part II is a thorough review of the marl deposits in which New Jersey is so rich, and which constitute so important a resource. The third part continues former work on the collection of data for a general report upon the water supply and water power of the State, while the fourth part is a collection of the data accumulated during 1892 on the artesian wells of Southern New Jersey.

The first fruits of Professor Smock's visit to Europe to study the Dutch system of sea dikes are laid down in the fifth part of the report. The usual statistics are submitted, which show that in 1891 the production of iron ore was 551,258 tons, while the production of zinc ore was 76,032 tons.

EIGHTEENTH ANNUAL REPORT OF THE CHIEF INSPECTOR OF MINES OF OHIO. Columbus, 1893.

Robert M. Haseltine has made his usual report as Chief Inspector of Mines to the Governor of Ohio, his figures showing that in the year 1892 the production of coal was 14,591,908 tons, of which 2,239,080 tons were produced by mining machines. In all there were 21,002 miners employed, of whom 333 were engaged in operating mining machines. There were 5970 day hands, of whom 2301 were employed in following up the mining machines, blasting down and loading the coal after it had been undermined. There were produced in 1892, 1,253,110 tons of fire clay, which was a heavy increase over previous years. The production of iron ore has gained a little, but still remains insignificant. The production was 8680 tons of blackband, and 81,042 tons of hematite. The usual elaborate statistics follow. The bulk of the volume, however, is taken by the detailed reports for every individual mine made by the inspectors of the different districts.

FIFTEENTH ANNUAL REPORT OF THE BUREAU OF STATISTICS OF LABOR AND INDUSTRIES OF NEW JERSEY.

The Chief of the Bureau of Statistics of Labor and Industries of New Jersey has continued during 1892 his investigations into the co-operative building associations of that State, where they have developed into so important a factor. At the close of the year 1892 there were in active existence in that State 291 associations, with 1775 series running, 571,665 shares outstanding, of which 153,813 were pledged. There were 87,762 shareholders and 21,752 borrowers, the net assets of the associations figuring up to \$29,989,767. Newark, with nearly \$6,000,000, and Jersey City, with a little over \$5,000,000, are the two principal towns in which these associations flourish. Very interesting details are given concerning the management of the different bodies, which is followed by official statements of a number of the associations on the part of their secretaries. The detailed report of each of these associations is tabulated for ready reference.

The second part embodies a continuation of the line of investigation begun a number of years ago, whose object it was to ascertain the number of years workmen are able to follow a given employment. During 1892 the bureau devoted its attention to cigarmakers, bakers and railroad trainmen, the latter including engineers, firemen, brakemen, conductors, switchmen and wip-

ers. The individual returns aggregate 4853. The reports give the age at which work was begun and the age at which loss of activity was first experienced and its causes. The Chief of Bureau presents details of this investigation which afford at least approximate data.

POOR'S DIRECTORY OF RAILROAD OFFICIALS AND MANUAL OF AMERICAN STREET RAILWAYS; 1893. H. V. & H. W. Poor, 70 Wall street, New York.

Poor's compilations are too thoroughly well known in the many trades which seek patronage from railroads to need lengthy reference by us. The Directory of Railroad Officials gives lists of all the officials of the operating railroads in the United States and Canada, and of the chief railroads in Mexico, and presents also official lists of master mechanics, purchasing agents, chief engineers, master car builders, master car painters, general managers and general superintendents. The same volume deals with private logging and mining roads and with city and suburban tramways.

The semi-annual meeting of the Western Pennsylvania Central Mining Institute was held in Pittsburgh last week, the sessions lasting two days. In his opening address to the delegates, President T. K. Adams said he believed the institute had been one of the most powerful auxiliaries in disseminating technical knowledge among the miners of Western Pennsylvania. During the session a number of papers were read, one of which, entitled "Electrical Machines and Electricity as Applied to Mining as a Power," was presented by George Gould of Cannelton, Pa., and attracted considerable attention. In his paper Mr. Gould advocated the use of a simple machine which could be adjusted to suit any depth of vein in preference to that which causes the mixing of coal, slate and dirt, destroying the commercial value of the product. T. J. Evans of Johnstown, Pa., discussed the question of "Which gives the most useful effect in mine ventilation, blowing exhaustion, fans or furnaces." The next session of this institute will be held in Pittsburgh in June next.

It is reported that the coming week will be opened with more labor disturbances in the Mahoning and Shenango Valleys. Puddlers expect a reduction which will bring their wages to a level with the price paid in non-union mills—viz., \$4 per ton. Pittsburgh manufacturers whose puddle mills are operated on a union basis declare that they do not intend to make such a demand for the reason that the small quantity of muck bar being produced cuts but a slight figure in their total output. In other districts where but little steel is used operators find it necessary to get a lower rate for puddling so as to compete successfully with the non-union mills, which are the largest producers of muck bar and merchant bar iron, consequently a general reduction is talked of and considered certain. So far consideration of the matter has been confined to Pittsburgh and Eastern Ohio.

The ordering of several more United States war ships to Rio indicates the determination of the Government to protect commerce and American interests in that troubled seaport.

The Iron Age

New York, Thursday, December 28, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Passing of 1893.

Within a few days the books for 1893 will be closed. The balance then struck will be satisfactory to very few business men. But it can hardly be said that they will be disappointed, as the year opened with rather gloomy prospects and a general apprehension of troublesome times. There were some to be found in almost every branch of the iron trade who refused to take counsel from their fears and persistently looked for better times, but they were without influence, and as the months rolled by their belief in an improvement also grew weaker. It may safely be said that the experience of 1893, in its percentage of shrinkage in the volume of business from that of the preceding year, has broken the record. Never before was there such a rapid reduction in the demand for iron and steel. From the crude material to the most highly finished products the curtailment of business was without precedent. The natural concomitant of such a condition of affairs was a thorough demoralization of prices. Values have tumbled lower than in any previous period of depression, and for some time the question of profits seems to have been eliminated from transactions.

From the beginning of the year until now there has been a constant succession of failures among manufacturers and iron and steel merchants. Great establishments, supposed to have almost unlimited resources, have been swept from their rock-rooted foundations by the rising tide of disaster, together with an almost uncountable number of small concerns whose capital was sufficient for ordinary conditions, but could not withstand the terrible strain of so severe a financial panic as that of 1893. Honored names, that have been respected for many years as synonyms for stability and sagacity, are frequent on the rolls of the bankrupt for this year. Assets that were not capable of immediate conversion into cash have been no better than worthless paper in meeting the demands of creditors, and many sound business men have for the first time realized how suddenly riches can take wings. Prosperous communities, that have thriven wonderfully in the bright sunlight of the prosperity with which this land had been blessed for so many years, have been prostrated by the blight which has overtaken their manufacturers. They have been transformed from wealth-producing hives

of industry into settlements of paupers, appealing for relief to the citizens of other localities who are themselves struggling with the problem of caring for the unemployed thronging about their own doors. The public soup-house, which has only been known at rare intervals in American history, has become an institution in every city and in most of the large towns. Starvation threatens many a man of brawn and brain who is willing and anxious to work but is unable to find employment. This is the picture which 1893 leaves on the canvas that records the procession of the years and the birth of epochs.

But, leaving this dismal subject, what of the future? Will 1894 bring better times? Common sense argues in the affirmative. There is, of course, no magic in mere numerals, and the writing of 1894 will not in itself bring a change in business. But we have faith that the worst is over, and that the experience of 1893 will neither be repeated nor even rivaled for years to come. The revival of prosperity may be impeded by unwise legislation, but it cannot be completely checked. The business interests of the country are on the way to recovery, and they will eventually completely recover. As spring approaches the ranks of the unemployed will be drawn upon by establishments that are even now endeavoring to get matters into shape so that a start can be made as soon as prospects are favorable for business. Men of enterprise, through whose ambition or unrest other men find employment, will undertake new ventures, as before, and timid capital will come out of its hiding place at their seductive call. Although 1893 may expire with leaden skies and frozen streams and a pall of snow covering all vegetation, the sun will again shine in 1894, the water will run, the grass will grow, and men will imbibe fresh courage and attempt greater achievements than the past can boast.

Steel for Railroad Ties.

One of the fallacies which seem to possess a very tenacious life is that cheapness of any staple article must necessarily be reflected in a rapid increase in consumption. Too many business men and manufacturers expect the effect of low prices to tell almost immediately. As a matter of fact, it takes a very considerable time until a new material or a new article overcomes prejudice and finds a widening use. Probably one of the best illustrations of this was furnished by the history of nickel. When powerful interests took hold of the deposits of Noumea they greatly increased the production, hoping to stimulate consumption by a marked lowering in the price. They simply found, in the first few years, that they were accumulating an unprecedented stock. In recent years the opening up of the Sudbury deposits led to further reductions in price, and yet the consumption has

not developed in proportion. Had it not been for the electrical developments copper would have gone through very much the same experience.

We admit, of course, that ultimately consumption is very largely increased as the effect of low prices, but we contend that its development is far from being as rapid as many expect. We are led to call attention to this experience since the hope is being expressed, as a modest compensation for the sufferings which the iron trade is going through, that steel will rapidly capture new fields and that we shall experience a growing *per capita* consumption. There can be no doubt that that is sure to come, but it is well not to be too sanguine.

Among the uses in which cheap steel seems destined to open new channels is conspicuously that for railroad ties. The American iron trade has been pretty indifferent to this subject thus far, for very good reasons. It was all very well for the advocates of steel ties to figure out that there was economy in their use, considering their longer life and their ultimate value as scrap. The fatal objection thus far has been their excessive first cost, which few American railroads had the financial ability to meet. That objection, however, is now gradually disappearing with the unexpectedly great decline in the price of soft steel. Probably steel sleepers could be produced to-day in certain sections of the country at, say, 1.5 cents per pound, finished. The production of this class of material has been a source of a very large tonnage to European steel mills, and might become valuable to some of our large plants which are suffering from lack of work, present or prospective. The users of steel ties could avail themselves of the long experience of railroads abroad, so that they would not be hampered by a protracted period of experimenting. We believe that the time is approaching when steel makers and railroad managers alike should carefully look into this important subject.

The phenomenally low panic prices at which iron and steel, crude and manufactured, have sold during the last month have made it possible to do some export business. We have covered the bulk of the requirements of such countries with which we are on favorable terms through our reciprocity arrangement. This is notably the case with Cuba. But in other lines, too, we have captured a little trade. In cast iron pipe our merchants have been able to figure on such contracts as 8000 tons for Mexico and 15,000 tons for Japan, with a very good chance of taking the business. Our modern pipe foundries have excellent methods of handling material and product, and now, with an exceedingly low cost of pig iron, notably in the South, they are in a position to make very attractive prices. They are being aided in some instances by the transportation interests, who are doing their

share to bring work into this country. While it would be a gratifying thing under present circumstances to capture a few foreign contracts, it will not do to regard them as the harbingers of regular business. On the contrary, it is devoutly to be hoped that our home markets will again soon get into a sufficiently remunerative shape to enable us to abandon efforts in foreign countries whose business we can only secure by submitting to panic prices for manufacturers and starvation wages for labor.

CORRESPONDENCE.

The Kihlafors Iron Works.

To the Editor: In E. C. Potter's flattering and favorable article in your valued journal about Swedish iron, and especially the Swedish iron and steel exhibits at the World's Fair, for which I and the Swedish iron and steel manufacturers feel most grateful, occur some statements about the Kihlafors Iron Works which surely have been given to Mr. Potter at the fair by some person not well posted on Kihlafors manufacture. As those statements may be somewhat disadvantageous for Kihlafors Iron Works I herewith humbly venture to make the following corrections:

Kihlafors Iron Works products consist of pig iron, gray, mottled and white, with the trade-mark R-W-n, and of this pig iron is wrought iron with the

trade-mark (R) W-n manufactured.

Their products have been exported principally to England, but also to Germany and other countries. The pig iron has been used for making Bessemer and open hearth steel, and the wrought iron for manufacturing the finest crucible and cement steel, for which it is considered very suitable on account of its purity, homogeneity, density and toughness. The percentage of sulphur in the pig iron varies between 0.01 and 0.015, and phosphorus between 0.026 and 0.028. The percentage of sulphur in the wrought iron varies between 0.005 and 0.007, and the phosphorus between 0.023 and 0.024. The price of the pig iron is £5 and the wrought iron £12 per ton, free on board ship at the port of Söderhamn, Sweden. Kihlafors Iron Works' products have been awarded the highest prizes at the exhibitions at Paris, 1855 and 1867, at London, 1862, at Stockholm, 1866, at Philadelphia (Jernkontorets Collective Exhibit), 1876, and at Chicago (Jernkontorets Collective Exhibit).

ERIK G. SON ODELSTJERNA.
FILIPSTAD, SWEDEN, November 30, 1893.

The following rate of wages is now being paid at the works of the Martin Coke Company, at Fairchance, Pa., in the Connellsville region: Mining heading coal, 85 cents per 100 bushels; mining room coal, 75 cents per 100 bushels; haulers, \$1.60 per day; trackmen, \$1.60 per day; day labor, \$1 per day; drawing coke, 40 cents per 100 bushels; leveling, 7½ cents per oven, and all other work in proportion. It is estimated that these rates are about 35 per cent. below those paid under the scale of the H. C. Frick Coke Company, which expires on January 31, 1894.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., December 26, 1893.

The majority members of the Ways and Means Committee who have remained here during the Christmas holidays do not seem to feel any apprehension as to the result of their parliamentary contest in defense of their bill in the House.

They propose to begin the debate next week and bring it to an early finish. Both sides will have a fair chance for discussion. After the record has been made in general debate and the amendatory stages under the five-minute rule are carried to a reasonable extent the vote will be taken.

The effort to organize an opposition within the ranks of the majority under Bourke Cockran is not without considerable strength, but whether it can be brought up to a point where success might be possible will not be definitely known until the House reassembles.

There has been some expectation that the Northern Representatives of the majority during their visits among their constituents might learn some facts of the situation which might stiffen their views sufficiently to co-operate in a movement to materially amend the bill in Committee of the Whole, but from present indications there will be no changes in the House except with the approval of the majority of the committee in charge, and these are not likely to be important. The objection which most of the majority raise against the bill is not as to the rates, but the abnormal conditions upon which it is framed. They do not favor a bill which cuts off about \$60,000,000 of revenue from customs which has to be made up from direct taxation from internal sources.

They claim the platform upon which the majority are operating demands a Tariff for revenue, which is not the character of the bill which has been reported from the Committee on Ways and Means. It is not probable, however, that this will make much difference at this stage of the contest.

The discussion in the House from present indications will be purely on partisan lines, the local interests of constituencies controlling the views of individual Representatives. Whether these views can be crystallized into an organized opposition when the vote is taken is not probable from present appearances. There is a general feeling, however, among the majority in the House that when the bill reaches the Senate it will be taken up with less reference to politics, and will there be so amended and modified as to make it what party promises demand—a revenue tariff.

If the Senators who have expressed themselves as favorable to a very radical change in the bill, as reported from the Committee on Ways and Means, carry out their plans, coal will be restored to the dutiable list at about 45 instead of 75 cents a ton. Iron ore will also be restored at a low rate. The question of free ore, however, does not seem to be such a serious one to the Senators as free coal. It is claimed that American ores are so superior to the foreign that the latter will not come into competition more than at present for mixing purposes.

This question, however, will be settled to the full satisfaction of the Senate Committee before any action is taken.

The free lumber and salt will doubtless be allowed to remain, unless the

States interested can form a combination with coal, iron ore and wool.

The item which shares with coal and iron ore the greatest strength in both Houses of Congress is wool. The advocates of free wool have not been so vigorous in their demands since they have found woolsen subjected to a rigid cut with the rest of the dutiable items under the Ways and Means bill.

A careful canvass of the House reveals the fact that if the interests of iron ore, coal and wool can make common cause in the ranks of the majority, with the incidental aid of lumber and salt they would be able to control the situation and restore these items to the dutiable list, if not at the full rates of the existing duty, at all events at a compromise figure which would tide over the present crisis until the people can have an opportunity to take a dispassionate view of things and render their verdict accordingly. Whatever shall be done by the present Congress in the way of Tariff legislation will remain in force until another national election comes around three years hence. There are some who claim that the industries of the country by that time will have adjusted themselves to the new conditions and that the tariff as an issue will be eliminated from national politics. That remains to be seen if the opponents of the bill fail to defeat or modify it. The opponents of the tariff bill among the majority in the House are counting upon the New York, Alabama, Louisiana and Maryland Senators, with one each from New Jersey, Ohio and West Virginia, to put the measure in a less objectionable shape. But this at present is an uncertain quantity.

Senator Voorhees, who is chairman of the Committee on Finance, is disposed to be very conservative. He says we want a tariff bill which will yield revenue, not reduce it, and American industries, if not protected beyond the point of raising revenue, must at least be protected up to that point.

The committee, as they now talk, are disposed to be very fair in the matter of giving the manufacturers a chance to be heard in their own behalf. They are already in receipt of a mass of petitions and letters from every class of the people pointing out the inevitable derangement of business and industry if the bill before the House should pass.

The attitude of Senators Hill and Murphy is very pronounced against the bill in its present form. As they are not likely to be controlled except by the interests of the great State at their back, their opposition in the Senate is likely to produce results if possible.

The statistical documents which are being prepared under the auspices of the Ways and Means Committee do not strengthen their measure in the opinion of many of those who will have it to defend.

A table of comparisons showing an estimated loss of revenue of \$65,407,000 condemns it in the opinion of many even of the majority, who insist that they promised the country a revenue tariff, which this is not. The duties under the metal schedules, it is shown, have been reduced from \$20,526,000 to \$12,631,000, and under other schedules in the same proportion.

The contest in the House will be short. The managers of the bill are still counting upon getting it in the Senate by February 1. It is generally conceded that the quicker it gets there the better, as the real tariff battle will be fought in that body.

The majority and minority reports of

the Committee on Ways and Means on the bill as a rule find their champions on partisan lines. Outside of this there is little said on the subject. The reports are regarded as setting forth the position of the two great parties and the general line of support and opposition. The antagonism within the ranks of the majority will not be conducted on the lines of party or the reports, but from the standpoint of local interests.

OBITUARY.

GEORGE H. BABCOCK.

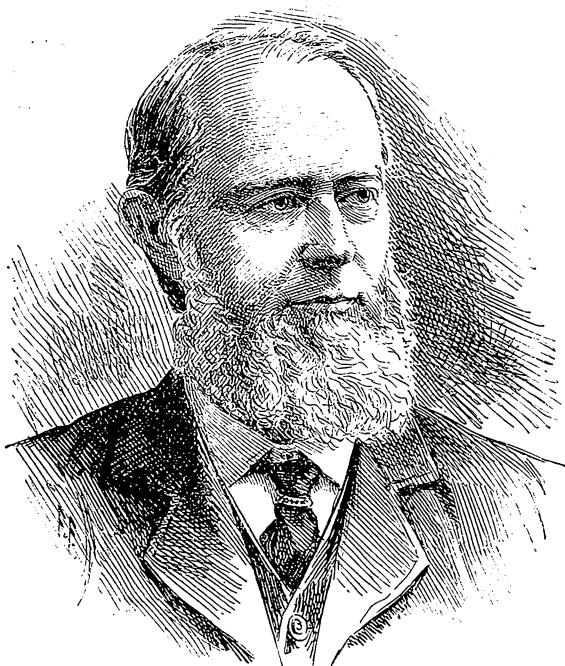
STEPHEN WILCOX.

The death of George H. Babcock on December 16 and of Stephen Wilcox on November 27, happening so nearly at the same time, is a rather singular coincidence. They were intimate as

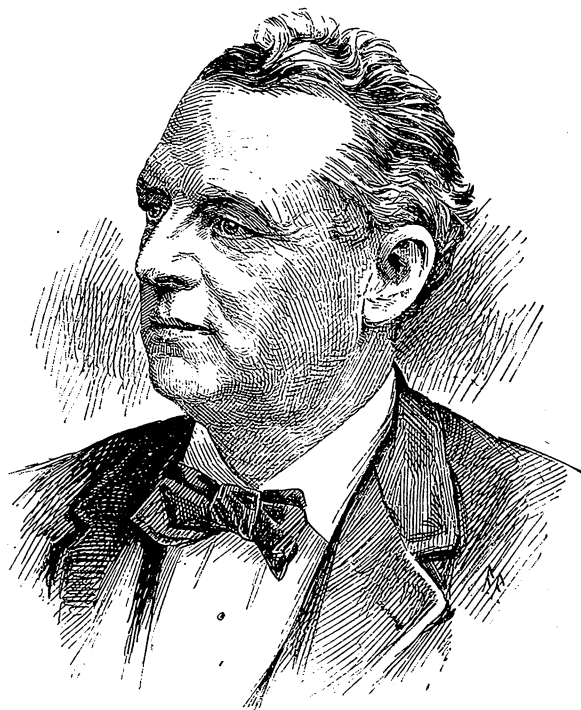
economical except for small units, and that neither could hope to compete with the steam engine on even terms.

Mr. Babcock's early experience in business was in connection with woolen mills; he next started a newspaper at Westerly, which is now published, though under a different name. He was one of the first to practice photography, and through life manifested the liveliest interest in the work of the camera. He was the first inventor of the polychromatic press for printing several colors at one impression, and upon this press as a foundation all the present machines for printing in colors are built up. The first printers' bronzing machine was also a result of his ingenuity. He next entered the office of Thomas D. Stetson of New York, who had a large practice as a patent lawyer. Afterward he was connected with the Mystic Iron Company and the Hope Iron Works of Providence

York to push their engine business, and arrangements were made by which they were built by the Hope Iron Works of Providence; by Morton, Poole & Co., Wilmington, Del.; Poole & Hunt, Baltimore, Md., and the C. & G. Cooper Company of Mount Vernon, Ohio. As above mentioned, this business fell through on account of the competition due to the free building of Corliss engines, and they started the New York Safety Steam Power Company, building small engines with the safety boilers. This was continued for a number of years, during which the manufacture of the boiler based on Mr. Wilcox's invention was begun, and it gradually assumed such proportions that in 1878 both withdrew from the active management of the Safety Steam Power Company to give all their time to the development of their boiler business. This was continued as a firm up to 1881, when it was formed into a



GEORGE H. BABCOCK.



STEPHEN WILCOX.

boys, but as young men they were in different enterprises; when they reached full manhood they became associated in business, and by their ability, energy and perseverance revolutionized an important industry and succeeded in establishing the largest boiler manufacturing concern in the world.

Mr. Wilcox was born in Westerly, R. I., to which town Mr. Babcock removed when a boy from New York, and there they grew up together and formed that close friendship which continued through life. While a young man Mr. Wilcox became identified with the development of the steam engine, and his invention of a practical caloric engine really antedated that of Ericsson, both submitting their engines to the Light House Board, by whom they were to be used in operating a fog horn, about the same time. For several years Mr. Wilcox studied energetically the caloric, gas, and oil engines, probably spending more time and money on his experiments than had been spent before or since. As a result he became convinced that these methods of generating power were not practicable or

as draftsman. It was while at the latter place that he invented the system of cut off engine afterward known as the Babcock & Wilcox engine, the two men joining in business relations then for the first time. This engine was successful as long as the Corliss patents were in force, but as soon as they became public property competition reduced the price of engines, and as the Babcock & Wilcox engine was expensive to build the business was dropped. This was in the year 1866 or 1867.

Previous to this, in 1856, Mr. Wilcox invented the original of all the inclined water tube style of boilers, having a set of inclined water tubes connected with water spaces at their ends and to an overhead steam and water reservoir, through which there was a continuous circulation of water and in which a cross flow of the gases was established by means of diaphragms. This invention was perfected by both, and later by them and other engineers in their employ, and was the base upon which the business of the Babcock & Wilcox Company was built. In 1868 they came to New

stock company. At that time Mr. Wilcox dropped out of active business life but continued making experiments on compound, triple and quadruple expansion engines at high pressure in connection with marine boilers, while Mr. Babcock remained at the head of the business and was active for a number of years.

Mr. Babcock was of a quick, decisive disposition, able to bring to bear on any subject all the knowledge he possessed in relation to that subject. He could readily and rapidly take up a new subject, and master it thoroughly in all its details. When he was 58 years old he took up the study of French and acquired the language sufficiently for all practical purposes for reading, writing and conversing, showing that his mental ability was strong at that time. He was like a mechanic with a modern set of tools, every one sharp and ready at hand for use.

Mr. Wilcox, on the other hand, was of a retiring disposition, well grounded and thoroughly equipped for reasoning out all mechanical problems, with a well balanced mind, singularly adapted

THE WEEK.

The general dearth of employment throughout the country is causing an extraordinary outflow of foreign laborers by the eastbound Atlantic vessels. The immigration authorities at Ellis Island, N. Y., report that their office is besieged daily by destitute aliens who, unable to obtain the means of livelihood in the United States, are urgent to be returned to Europe at the Government's expense. These applicants are mainly Italians and Hungarians, some of whom have tramped hither on foot all the way from Chicago and other distant points.

Chauncey M. Depew, who has just returned from a flying trip abroad, describes the commercial and industrial depression on the other side of the water as being equally acute with that of the United States. He says that "the universal complaint all over Europe is bad business. Nothing like it has been ever experienced. They all feel and look poor, and the number of unemployed is unprecedentedly large."

Buffalo's annual statistics of commerce, recently published, show that the present year has broken all previous records in the volume of the lake grain traffic as well as in the low cost of transportation. The grain receipts of the port amounted to 187,235,160 bushels, or 6,000,000 bushels more than those of 1892, and nearly thrice the total annual receipts of ten years ago. The freight rates for 1893 averaged 1.7 cents per bushel, the lowest in the history of lake commerce.

Governor Fishback of Arkansas has written to the President urgently complaining that the Indian Territory is a hotbed of criminals and outlaws, especially of train robbers, who there lay their nefarious plans and there seek refuge when those plans are consummated. He asserts that the Territory is a constant menace to the neighboring States, and the existing judicial conditions favor the continuance of these evils. The Governor wants the United States to assume complete jurisdiction over the Territory as the only remedy.

Statistics published by the *Railway Age* show very forcibly how disastrously the panic of the past year has operated in the railroad industry. The presentation shows that 71 roads, with a mileage of nearly 23,000 and an aggregate capital of about \$1,300,000,000, have gone into the hands of receivers, three-quarters of them having assigned in the last half of the year.

A joint committee of three United States Senators and six Representatives will visit Nicaragua shortly to inquire into and report to Congress upon the material and political aspects of the canal enterprise.

The Walter A. Wood Mowing & Reaping Machine Company, a corporation organized under the laws of New York, but owning and operating a large establishment at St. Louis, have filed a mortgage to the United States Trust Company of New York, to secure \$2,000,000 6 per cent. 12-year gold bonds, dated December 1, 1893, and maturing December 1, 1905. The mortgage given to secure the payment of these bonds covers all the buildings, machinery, fixtures, railroads, rolling stock and industrial plants owned by the company in all parts of the country.

MANUFACTURING.

Iron and Steel.

The Massillon Rolling Mill of Jos. Corns & Son, Massillon, Ohio, was closed down last week for an indefinite period on account of lack of orders. One hundred and seventy-five men are thrown out of employment by the suspension.

We are advised that the report that Philadelphia capitalists were about to purchase the plant of the Dunbar Furnace Company, Dunbar, Pa., is untrue. No. 2 stack of this concern is now being prepared for blast, and will be put in operation as soon as possible by the present owners.

Mabel Furnace of Perkins & Co., Limited, at Sharpville, Pa., after an idleness of four months, has again resumed operations.

Some excellent records for production have recently been made in the Bessemer steel plant of the Bellaire Nail Works, Bellaire, Ohio. In one day recently over 500 tons of steel was turned out, and this amount was very little above the average for the entire week during which it was made.

When in full operation the plants of the Cambria Iron Company and the Johnson Company, both of Johnstown, Pa., give employment to about 7000 men. At the present time both these establishments are employing about 6000 men, showing that less than 1000 men are idle. Official notice has been given that Series A of the Johnson Company bonds will be redeemed at par on January 10, by the Citizens' National Bank, Johnstown, Pa.

About January 1 the Amalgamated Association of Iron, Steel and Tin Workers, at Pittsburgh, will be notified by the iron manufacturers of the Mahoning Valley that they will demand a reduction to \$3.75 per ton for boiling, which is \$1 less than the rate agreed upon in the scale adopted about November 1. This proposed reduction is justified on the grounds that non-union mills in Pittsburgh and at other places are paying less than \$4 per ton for boiling. If the proposition to reduce the price of boiling in the Mahoning Valley mills is carried out, it will probably not go into effect before April 1, 1894, as under the terms of the scale agreed upon three months' notice must be given by either side before a change in the rates of the scale can be made.

A meeting of the stockholders of the Columbia Iron & Steel Company of Pittsburgh, with works at Uniontown, Pa., will be held at Uniontown on December 28 for the purpose of electing a new board of directors. A short time after this election occurs there will be a meeting of the newly elected directors to elect a president, secretary, treasurer and other officers.

The Muncie Muck Bar Company recently organized at Muncie, Ind., and now operating the plant of the Muncie Nail Company at that place, are now turning out a daily average of 25 tons of muck bars.

Jeremiah A. Long of Akron, Ohio, recently appointed Receiver of the Akron Iron Company, has taken charge of the branch offices of that concern located in New York, Boston and Philadelphia. At the Philadelphia branch it was found that the assets amounted to between \$50,000 and \$60,000, while the liabilities were less than \$200. It is stated that the other branch offices also made excellent showings.

Last week notices were posted in various places at the Homestead Steel Works, Homestead, Pa., stating that the readjusted scale would be ready for signature on December 26, at 10 a.m. The new scales were left with the superintendents of the various departments. The notices state that all the tonnage employees desiring work under this scale must sign the same before Saturday, December 30, 1893, otherwise their positions will be filled by others. It is claimed that the revised scale affects only the wages of the tonnage men, and these have been expecting a reduction when the new scale was presented. The general impression, based by the men upon the aggregate tonnage earnings, is that in some positions the reductions will be equivalent to 40 per cent.

Furnace No. 2 of the Sloss Iron & Steel Company of Birmingham, Ala., whose rated capacity is 100 tons a day, made an

to all kinds of mechanical experimenting and able to size up the results and reduce them to practice; though much slower in argument until he had thought a problem out, when he had once mastered it his arguments were clear, to the point and very convincing.

Mr. Babcock was a past president of the American Society of Mechanical Engineers, and they were both among the earliest members of the society, of which both were life members. Mr. Babcock was of a literary turn of mind, and possessed a forcible and clear way of presenting facts. He lectured a number of times at Cornell University on scientific subjects.

Mr. Babcock was a prominent citizen of Plainfield, N. J., to which place he went to live in 1873, and he had been president of the Board of Education since 1885.

Mr. Wilcox was a valued citizen of Westerly, R. I. The people of that place wanted to erect a soldiers' monument, but Mr. Wilcox suggested that a library be erected instead, his argument being that the latter would be of practical benefit to the people. He got the citizens interested in his scheme, and they donated a small sum toward the project, when Mr. Wilcox stepped forward, bought a lot and contributed a sum sufficient to insure the erection of a substantial and creditable structure. The building, which is now in process of erection, will contain, besides the library, lodge rooms for two G. A. R. posts, and the basement a gymnasium for the boys of the town.

The Babcock & Wilcox boiler was brought to its present development by the persistency and courage, at the outset, of the two men who have just passed away in embodying their own ideas in it and in using the thoughts of others where they could be adopted with profit. They lived to enjoy the fruits of their labors to a greater degree than is given to most men and have passed away in the prime of life, regretted by those whom they have left.

C. M. HOPKINS.

C. M. Hopkins died at his residence in this city, suddenly, December 26, of acute rheumatism. He was ill but a few days, having been at his place of business, 64 Reade street, New York, as late as December 22. He was best known to the hardware trade South, where he represented six or seven manufacturing concerns as selling agent in that territory, among which were the Mallory Wheeler Company and Hermann Boker & Co. He was very popular with his associates and customers, and is referred to by merchants as having been thoroughly informed in his business, of excellent character, and loyal in friendships. He was born in Charleston, S. C., about 48 years ago, and after the Rebellion, where he served as an officer in the Confederate army, he was employed by Moritz & Keidel, Baltimore, Md., afterward with S. A. Haines Company, New York. His remains will be taken to Baltimore, December 28, where the services will be held.

*As we go to press the death of Sidney Shepard of Sidney Shepard & Co., Buffalo, N. Y., is reported. We defer until a later issue reference to his business career, and the prominent position he has long occupied in the lines with which he has been actively identified.

Preparations for the Midwinter Fair at San Francisco have so far advanced that an admission fee is now charged to the fair grounds.

excellent record in the first week of December. The output was as follows: December 1, 170 tons; December 2, 162; December 3, 162; December 4, 171; December 5, 186; December 6, 172, and December 7, 181, a total of 1204 tons. Of this, all was foundry except 61 tons. The average daily output was 171 tons. The previous past week's record averaged 140 tons per day. The Sloss Iron & Steel Company are preparing to put their No. 1 Furnace in blast.

David B. Dewey of Chicago, the recently appointed receiver of the Minnesota & Wisconsin Railway and the Wisconsin Iron & Lumber Company, says that any statement that, even by implication, included the Eagle Furnace Company of Spring Valley, Wis., in the receivership was entirely wrong. The Eagle Furnace Company is a corporation independent of the corporations included in the receivership. It is in no way affected by the appointment of a receiver, except to be materially benefited, as the receiver will be able to carry out contracts in existence between the furnace company and the corporations under his control, by which the furnace company will be supplied with ore, charcoal and shipping facilities that will make it a prosperous operating industry. The furnace company is under highly skilled management, and the iron made from this ore is of a superior quality. The receivership of the railway and Wisconsin Iron Company is the result of a mutual understanding between Senator Sabin, the principal owner of the corporations, and the creditors, through which capital to develop and conduct the business has been arranged for, the ultimate object being the reorganization of the companies upon a substantial footing. The bondholders and creditors generally believe in the value of the properties, which through the lack of capital have not been developed.

Another tin plate works is projected at Ellwood, Ind. The promoters are I. L. Morris of Chicago, Edwin Stevens of Cincinnati, and E. Levy of Ellwood. Mr. Morris was formerly superintendent of the sheet mills of the Corning Steel Company. They have organized a company with a capital stock of \$300,000, and propose to erect a rolling mill to roll black plates and to manufacture 2500 boxes per week. They announce that work on the buildings will begin at once.

We can now state upon good authority that the Irondale Steel & Iron Company, whose works were recently burned down at Anderson, Ind., will build a new plant at Middletown, notwithstanding contrary reports. Machinery not too badly damaged during the fire will be removed to the new location a few miles distant, and used in connection with such new parts as may be necessary. The plant will not be as large as originally intended, but it will be constructed in a manner that will admit of extension whenever the state of trade warrants such a course of action. The product of the new works will be iron and steel sheets of the lighter gauges.

William F. Bonnell, formerly manager of the Hubbard Iron Company, Hubbard, Ohio, and a number of old employees of that company are endeavoring to form a corporation on the co-operative plan to operate the rolling mills at that place, which have been idle for some time. To increase the working capital workmen have agreed to leave part of the earnings in the treasury of the new company. The merchants of Hubbard have agreed to accept pay orders. The plant is in good condition and ready to commence operations as soon as organization is perfected.

The part of the Aetna Standard Iron & Steel Company's plant at Bridgeport, Ohio, known as the Standard Mills, was operated to its full extent on Wednesday of last week. This was the first time such a state of affairs had existed since the June shut down this year. Operations were resumed again Tuesday of this week. In the Aetna department about one-half the plant has been operated.

The American Sheet Iron Works and the Phillipsburg Stove Works, both at Phillipsburg, N. J., closed down on December 23 to be idle ten days.

The Dover Iron Company, Dover, N. J., have suspended operations for an indefinite period. The works started about three weeks ago.

The Sargent Company, manufacturers of iron and steel castings, have opened a city office in room 519 Western Union Building, Chicago. Their steel castings department suffers from lack of trade at present but

the iron department is doing a comparatively good business. They are deeply interested in the tests of brake shoes now about to be undertaken by the Master Car Builders' Association. The tests will be made on eight different railroad as well as in a number of shops. The company welcome these tests in the confident belief that the brake shoes which they manufacture will come out with flying colors.

The puddling department of the Elmira, N. Y., Rolling Mills have been shut down for the holidays. The plate and merchant mills are, however, still in operation.

At the nail works of the Ellis & Lessig Steel & Iron Company, Limited, Pottstown, Pa., the nailers will be subjected to a 15 per cent. reduction, and the other employees in the nail department will be reduced 10 per cent., to take effect January 1.

The Mahoning Rolling Mill Company, at Danville, Pa., have gone into the hands of a receiver, in the person of A. S. Patterson, its president. The liabilities are said to be \$324,000, and the assets, \$332,000.

The plant of the Clinton Iron & Steel Company, at Pittsburgh, manufacturers of iron and steel plates, has been in operation to nearly full capacity since the middle of September last. If possible to do so it is the intention of this firm to operate continuously through the winter months, with the idea of offering employment to as many men as they can.

The Ellwood Shafting & Tube Company, Ellwood City, Pa., have recently secured a contract for a large quantity of seamless steel tubing to be used in torpedo boats now being built by the Government.

Machinery.

The Lidgerwood Mfg. Company, 96 Liberty street, New York City, have received word from Smyth & Munford, Point Pleasant, W. Va., of the completion and satisfactory test of the largest Locke-Miller cableway in existence. The span, which is 1505 feet 6 inches long, is erected over the Kanawha River, and so high that steamers pass underneath it at even the highest tides. The main cable is 2½ inches in diameter, and the load carried is 4 tons. The cableway spans the lock and dam which Smith & Munford are to build in the river, and the quarry from which they receive their stone.

There is a strong probability that the works of the defunct Northwestern Car & Machine Company, at Oshkosh, Wis., will pass into the possession of the Chicago & Northwestern Railway Company.

The Sparta Iron Works, at Sparta, Wis., are now under the management of a stock organization entitled the Sparta Iron Works Company. L. M. Newbury and his son Carl Newbury, together with J. U. Durant, constitute the new firm. They will have increased facilities for doing work in their line, which includes not only foundry work but well drilling machinery and all apparatus connected therewith.

The Marinette Iron Works Company of Marinette, Wis., and Duluth, Minn., by a unanimous vote of the stockholders has gone into voluntary dissolution, affecting both the works at Marinette and West Duluth. The business will go on uninterruptedly as before. The directors will act as trustees and legal administrators.

E. Munroe & Son, boiler manufacturers of Pittsburgh, have a contract for furnishing two 150 horse-power water tube boilers for the new pumping station now being erected by the Monongahela Water Company, at McKees Rocks, Pa.

At the plant of the Hubbard Foundry & Machine Company, Hubbard, Ohio, the only department in operation is the foundry department, which is running on a large order for sinks.

The works of the Cleveland Twist Drill Company, Cleveland, Ohio, will be closed down during the holiday season. This is the usual custom of this firm, and during the shut down an inventory is taken and the usual necessary repairs are made. These works have been running full time, but with a reduced number of hands. The concern have a large stock of goods on hand, and will fill all orders promptly during the time their plant is closed.

A scheme is on foot to establish a \$30,000 machine shop and foundry at Boyertown, Pa.

The Berry & Orton Company, manufacturers of wood working machinery at Philadelphia, Pa., have made an assignment for the benefit of creditors. It is believed that the liabilities will not exceed \$50,000, and

that the assets will show a good surplus. The concern started business in 1869 and have never been known to suffer from financial difficulties before.

After January 1, 1894, J. W. Parker & Co., 41 North Seventh street, Philadelphia, who have represented the Ball Engine Company of Erie, Pa., in that city for some years will also act as their representatives in New York City for the sale of Ball engines.

The Helping Hand Engine Company, New Brighton, Pa., have been granted a charter of incorporation. The directors are as follows: Erastus E. Pierce, Walker De Crouch, Frank L. Smith, S. Merriker and J. Frank Mines, all of New Brighton, Pa.

The Westinghouse Electric & Mfg. Company of Pittsburgh have declared the usual semi-annual dividend of 3½ per cent. on the preferred stock, payable January 10, next.

The Fulton Truck & Foundry Company, recently organized at Mansfield, Ohio, have elected directors as follows: C. J. Langdon, W. E. Haycock, Reid Carpenter, R. G. Hancock, M. B. Bushnell, S. N. Ford and W. S. Cappeller.

It is reported that the New Albany Steam Forge & Rolling Mill Company at New Albany, Ind., will resume operations next month after a shut down of over three years.

The Smith & Anthony Iron Foundry at Wakefield, Mass., employing about 200 hands, has closed down indefinitely.

The Lake Shore Iron Works of Marquette, Mich., successfully cast a 60,000 pound fly wheel on the 16th inst., one of the largest castings ever made in the history of that foundry. The wheel is for the pumping engine of the Salisbury mine.

The men employed in the foundry of S. L. Moore & Sons Company, at Elizabethport, N. J., went on strike because some of them were asked to work overtime without extra compensation. The foundry was shut up and the firm posted a notice that work would be resumed with a reduced force and at reduced wages.

The Warren Foundry & Machine Company of Phillipsburg, N. J., closed down December 23 to remain idle until after January 1. A reduction in wages has been announced.

The Cleveland Machine Screw Company of Cleveland, Ohio, announce that the fire which visited their finishing department December 17 is not so serious as reported. They will have no difficulty in repairing the damage at once and expect to be in full operation in the course of a week or ten days.

R. D. Wood & Co.'s pipe and hydrant works at Burlington, N. J., have closed down indefinitely. About 450 men were employed. A member of the firm is stated to have said that Southern iron works have underbid them on several large contracts, so that the plant was forced to close down on account of lack of business. The company's works at Camden and Millville are still running.

The boiler works of the National Water Tube Boiler Company, at New Brunswick, N. J., employing about 100 hands, have made a reduction of 10 per cent. in wages.

Hardware.

The Eagle Mill of the American Screw Company, Providence, R. I., closed down December 19 for an indefinite period. The falling off in the demand for the company's goods has compelled them to reduce their production. Their force of employees has been materially decreased, while the number of working hours has also been reduced. The company had been expecting to resume their usual schedule January 1, but the proposed Wilson tariff bill makes this unadvisable.

At a meeting of the employees of the J. R. Torrey Razor Company, Worcester, Mass., on December 18, Thomas Scales and Joseph Booth were chosen to go to Washington and protest on behalf of the men against the adoption of so much of the Wilson tariff measure as relates to the duty on razors.

The Howe Scale Company, Rutland, Vt., shut down on December 23 for two weeks, during which inventory will be taken.

The proprietors of the Universal Plow Works, Wooster, Ohio, have given notice that their works will be started on January 1 after a three months' shut down. Notice of a reduction of 25 per cent. in

wages has also been given. The molders employed by the firm, at a meeting held to consider the matter, decided to refuse to work at the scale offered.

The New Britain Hardware Mfg. Company, New Britain, Conn., have commenced to run six days a week.

The rise in the river has had a very satisfactory effect on the Wheeling nail trade, allowing the mills to clean up their warehouses for the first time in many months. The Laughlin Nail Company are running again after an idleness of six weeks. The La Belle Iron Works are also running full. The two mills give employment to about 1500 hands.

The Howe Scale Company, Rutland, Vt., as assignees of Samuel T. Brady of the same place, inventor, have been granted two patents, one for a platform scale and one for a scale beam.

The Woodbury Whip Company have been incorporated, and have acquired and will continue the whip manufacturing business of Woodbury & Co., Rochester, N. Y. The capital of the company is \$150,000. The directors of the company are as follows: John C. Woodbury, J. Wesley Kingston and Charles E. Crouch, all of Rochester.

The True Mfg. Company have been organized at Portland, Maine, for the purpose of manufacturing hose nozzles, couplings, axles, files, wrenches, &c. The capital stock of the company has been fixed at \$50,000. Oscar D. Thomas of Brockton, Mass., is president of the company, and Geo. W. Jeffrey, also of Brockton, treasurer.

The plant of the Putnam Nail Company, at Neponset, Mass., was slightly damaged by fire on the morning of the 20th inst. The damage is estimated at \$5000. The origin of the fire is unknown.

Bateman & Meany's shear factory in Brookfield, Conn., was robbed of \$200 worth of shears on the 17th inst.

The plant of the Cleveland Machine Screw Company, Cleveland, Ohio, was badly damaged by fire on the afternoon of the 18th inst. The factory is a three-story brick building. The blaze was first discovered in the third story of the north wing, and some time elapsed before an alarm was sent in. When the fire apparatus arrived the whole of the upper story was in flames. A second fire alarm was sounded and additional engines responded. By the splendid work of the firemen the flames were confined to the upper floor of the factory. The loss is estimated at \$10,000. Repairs will commence at once, and the works will be started up again as soon as possible. The fire was the means of throwing about 100 men out of employment.

The new factory of the McKay Metallic Fastener Company, at Winchester, Mass., is nearly ready. The new shop is built of brick, stone and iron. The main building is 100 x 70 feet and four stories high. An addition will contain the blacksmith shop and other departments. A 200 horse-power engine has just been placed in position and will furnish the power requisite for the operation of the plant. The new shop will supersede the shop now operated at Lawrence, Mass., and many of the machinists who live in that place will remove to Winchester, where houses are being erected to accommodate them. The factory is located on a 15-acre site about 1 mile from the center of the town and on the main line of the southern division of the Boston & Maine Railroad. A station will be erected near the works and the schedule will be so arranged as to permit certain trains to stop there.

As noted in our last issue Wuehth Hardware & Mfg. Company, St. Joseph, Mo., will by January 1 be settled in their new six-story premises, 609 to 621 North Second street. At this new location the company will have exceptional facilities in the way of railroad side tracks and switches. Tracks extend into their building, which will enable them to load three cars at one time. They can also unload three or four cars at rear of the building and as many more on the track at the north side of the building. The first floor and basement of the building, which is 130 x 140 feet, will be used for the storage of staple and package goods, such as nails, barbed wire, tin plate, &c. On the second floor will be counting and general shipping rooms. The floors above will be used for general storage. The building will be fitted with electric light, electric call bells, speaking tubes and other modern labor saving devices. The

company will operate their own electric light and steam plants. By this move the manufacturing interests of the company have been concentrated at 302 and 308 North Second street, while a part of their old premises on Third street will be retained for storage of goods out of season. Notwithstanding the general depression in all lines the past few months the company advise us that they have made preparations for a vigorous campaign the coming year, and will start out January 1 with 35 traveling representatives—22 in hardware, 3 in cutlery and 10 in saddlery goods.

The Bath Harness Company, Bath, N. Y., have purchased the plant and good will of the Fred Morris Company, including their stock of harness, horse collars, &c., and will continue the business, making the same line of goods with the exception of a few changes in the harness, which will enhance the quality and style.

The Ludlow-Saylor Wire Company, St. Louis, are closing the year with a full order book in their art metal department. They are making a number of directory frames for the new 14-story Union Trust Building, St. Louis, and also a number for the Realty Building; also a lot of artistic stair rails for the residence of Fred T. Lock, Birmingham, Ala., and a stair and floor rail for the Eddy office building, Bloomington, Ill.

The H. P. Nail Company, Cleveland, Ohio, advise us that while they have shut down their works they are still doing business as heretofore. They state that they have a good stock of nails on hand, so that they are in a position to take care of such orders as are received from the trade.

Miscellaneous.

On the 13th inst. Judson A. Wann was appointed receiver of the Sun Vapor Light Company of Canton, Ohio. The assets of the concern are said to consist of lighting contracts in various cities, which are regarded as valuable if completed, but on which little would probably be realized if sold at forced sale. The real estate, machinery, &c., of the concern are estimated to be worth \$50,000, and the bills receivable and amounts due on contracts at \$100,000. The company have a plant at Canton, where lamps are manufactured, and have 72 branches in 15 States in cities where lighting contracts are carried. It is intended, if possible, to make arrangements to continue the business, as it is realized that a shutdown at this time would cause large shrinkage in the principal items of assets. The leading stockholders of the company are members of the firm of C. Aultman & Co., who have also gone into the hands of receivers. The petition for receiver asks for a sale of the plant.

The Manufacturers' Natural Gas Company of Pittsburgh have declared the regular quarterly dividend of one-half of 1 per cent.

About 60 employees of the Sewall Steel Shipbuilding Company, at Bath, Maine, went on a strike because non-union men were employed. The company maintain their right to employ whomsoever they may desire.

The Gilbert Hunt Mfg. Company, with a capital stock of \$60,000, have been incorporated at Walla Walla, Ore., to engage in the manufacture of threshing machines and other farm implements.

The Bignall Mfg. Company, one of the largest iron works in the western part of New York State and favorably known throughout the country, closed their doors the night of December 15 for an indefinite period. W. B. Robbins, treasurer of the company, says that owing to the present hard times it is impossible for the concern to continue business, but that up to the time of closing the works had been running on full time and employing the usual number of men.

The Cox Brass Mfg. Company of Albany, N. Y., have elected the following directors for the ensuing year: P. Wendell Parke, John Cox, A. B. Brown and P. F. Gaynor.

The Fort Plain, N. Y., Axle Works have resumed operations after a long shutdown.

The Norwegian Plow Company of Dubuque, Iowa, are erecting an important addition to their buildings. The new structure will be used for a warehouse and offices. A railroad track will run into the building, so that shipping can be done under cover.

Negotiations are pending between Kansas City capitalists and John Wilson of Rock Island, Ill., for the erection at Kan-

sas City of a large plant for the manufacture of agricultural implements.

A factory for the manufacture of metal wheels is to be built at Moline, Ill. It is announced that Deere & Co. and the Deere & Mansur Company, manufacturers of agricultural implements, have arranged for a factory for the manufacture of metal wheels, of which each of the two companies uses a large number annually. They expect to put up a building early in the spring.

Among recently authorized corporations in Illinois are the following: Crystal Machine Company, Chicago; capital stock, \$100,000; incorporators, Peter Douglas, Zenas F. Ringer and Harry A. Riddle. The American Gravity Company, Chicago; to make clocks, motors, &c.; capital stock, \$1,000,000; incorporators, Henry J. Olney, Samuel L. Smith and Joel L. Squier. Ruble Pressure Blower Company, at Chicago; capital, \$1,000,000; incorporators, Peter Hartford, J. L. Hughes and Edgar M. McGauley. The Ruble Blower Company, at Chicago; capital stock, \$1,000,000; incorporators, D. J. McMahon, William P. Blue and C. B. Ware. Western Metal Company, Chicago; capital stock, \$10,000; incorporators, W. C. Carpenter, Peter Carpenter and J. M. Heath. The National Cutlery Company, with a capital stock of \$75,000, were organized at Rockford, Ill., last week. The new company will employ 200 men at the start, and will, it is said, make cutlery by an improved labor saving machine.

Articles of incorporation have been filed by the Williams General Mfg. Company of St. Paul, Minn., with a capital stock of \$10,000,000. The business includes the manufacture of electric motors, aluminum wares and the Dent telegraph typewriter. The incorporators are D. H. Kent of St. Paul Park, president, and A. A. Price, vice-president; F. M. Johnson, secretary; P. L. Utley, treasurer, and C. J. Backus, all of St. Paul.

The Wheeler Rail Joint Company have been incorporated at Albany, with a capital of \$50,000, to manufacture rail joints in New York City.

It is stated that the Lobdell Car Wheel Company of Wilmington, Del., contemplate establishing a branch works at Raleigh, N. C.

It is claimed that a recent invention of R. R. Turner of Columbus, Ohio, bids fair to solve the smoke abatement problem. A recent test proved its merit as a smoke preventive, and also demonstrated that its use resulted in a considerable saving in fuel.

The Ten Mile Coal & Coke Company, with a capital of \$1,000,000, were granted a charter of incorporation under the laws of West Virginia last week. The company have purchased 2800 acres of coal lands near Clarksburg, W. Va., and propose to develop the same in the spring.

The Cambridge Roofing Company are adding new machinery and making improvements, notwithstanding hard times. They have recently placed an order with Geo. C. Keene & Co., Cincinnati, for a stand of corrugating rolls. A corrugating and forming press made by the same company has just been placed in position in the works of the Cambridge company.

The project of utilizing the Cox shoe factory at Fairport, N. Y., as a manufactory for metallic window screens, is being agitated and there is to be a meeting of business men to consider the proposition.

The St. Paul Implement Company of St. Paul, Minn., have filed corporate articles. The business to be carried on is that of dealing on commission in agricultural implements, pumps, &c., and in constructing windmills, pumps and tanks, and in doing a storage and transfer business. The incorporators are Philip S. Hand, William Dawson, Jr., and Edward M. Allen. The capital stock is \$50,000.

The Rogers Locomotive Works of Paterson, N. J., continue to reduce their number of employees.

The Iron Car Company, a new organization which supplants the Iron Car Equipment Company, at Huntingdon, Pa., have announced that their works will resume operations at an early date.

The plant of Randolph & Clowes, brass manufacturers, at Waterbury, Conn., closed down on the 23d for one week for the purpose of taking inventory and making minor repairs. The works will reopen January 2 with a prospect for steady work.

TRADE REPORT

There have only been surface indications concerning the probable course of events in the near future, and they have fortunately not been of an altogether discouraging character. It is true that work is wanted everywhere, and in the majority of branches it is wanted desperately. But it is a fact also that in some lines business is coming up quite well. Thus it is estimated that contracts for 50,000 to 60,000 tons of Cast Iron Pipe will be closed during the next 30 days, which is a good indication that municipalities are able to raise money. Besides this American shops are figuring on two orders for 23,000 tons in the aggregate for export. All this work will be taken at unprecedentedly low prices, since the leading shops throughout the country are cutting down to the bone.

The tonnage, however, is sure to be welcomed by Pig Iron producers, and is likely to impart tone to at least the Gray Forge end of the market. In Foundry grades a weaker feeling is developing, some of the Southern furnaces being again among the leaders of the anxious.

The latest developments in the Chicago market in Soft Steel Billets are causing uneasiness and indicate that the makers of the Pittsburgh and adjacent districts have succeeded in securing the backing of the railroads, through special rates, in their invasion of that territory.

In Structural Steel there has been relatively little movement. An opportunity has been afforded lately to test in a thorough manner the relative prices in this country and abroad. Specifications for some viaduct work for Japan were submitted some time since. The result of the figuring shows that Continental firms can put the work on board shipping port at as low a figure as it can be made in this country f.o.b. mill of the concern going lowest, down to cost. The freights are so enormously in favor of the foreign mills that the business is out of the question.

Our low prices of Old Material and to some extent of finished goods appear to be growing quite attractive to buyers in Canada. Inquiries from that quarter are becoming quite numerous, and considerable business has already been done in Old Steel Rails. That market deserves some attention. If any slaughtering is to be done let foreign markets get the worst of it.

Something in this direction seems to have been accomplished in Ferromanganese. To judge from shipments made via New York and Baltimore, about 2000 tons of Ferro have gone to England and the Continent since October. The English producers were closed down by the coal strikes. This gave an opportunity to work off a surplus. As a result thereof the English combination for the home market have precipitously dropped their price, which is now near the figure at which they have been willing to sell to this country all along. As a bit of retaliation the little episode is gratifying.

The summary of the new Homestead wages which has been forwarded to us by telegraph is interesting chiefly because it confers further advantages, which may be utilized to hammer the market even more vigorously in the future than in the past.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building,
Pittsburgh, December 26, 1893.

Last week was probably the quietest of the year in the Iron and Steel trades and the outlook is that the last week of the year will beat the record in this respect. Very few orders are being received, and these are for small lots and hardly create a ripple on the quiet surface. A good many concerns shut down last week for stock taking and repairs and will remain closed until after the first of the year. It is safe to assume that a number of concerns will find the balance on the wrong side of the ledger when the result of the year's business has been figured out. Prices show no material change, being purely nominal and depending altogether upon the size of the order and the terms of payment. In this connection it is worthy of mention that credit lines are being drawn tighter than ever before, and 30-day settlements seem now to be the rule, instead of the exception, as was formerly the case.

Pig Iron.—The market is absolutely featureless. Buyers are putting off making purchases just as long as they can and when they do go in the market buy only enough to run them a short time. In addition, shipments on old contracts are being deferred to a very great degree by buyers who cannot use the Iron as fast as they expected and do not want to pile it up. Another feature of the situation and an important one is that only a limited number of furnaces have made contracts for Coke, and until more of these have been placed the uncertainty of the future as regards prices will continue. We are not advised of any transactions beyond a few sales of 100 and 200 ton lots, and repeat our quotations of last week as follows:

Neutral Gray Forge.....	\$10.00 @	cash.
All-Ore Mill	10.00 @	\$10.25 "
No. 1 Foundry.....	11.75 @	12.00 "
No. 2 Foundry.....	11.25 @	11.50 "
Bessemer	10.75 @	11.00 "

Billets.—The past week has been extremely quiet. No large orders have been placed for some time, and, with the exception of an inquiry for 4000 tons for January and February, none are in sight. We note a sale of 400 tons at a price equal to \$16.70 at maker's mill. We quote the market at \$16.50 @ \$16.75 at maker's mill.

Ferromanganese.—We make nominal quotations of \$51.50 @ \$52, delivered, for 80 % domestic.

Plates and Sheets.—Nothing of interest came up during the week. Three or four of the larger concerns here are fairly busy on small orders. It is expected that after the turn of the year some orders calling for considerable tonnage that have been held back for certain reasons will be placed. Prices are without material change and we quote as follows: Tank Steel, 1.35¢ @ 1.37½¢; Shell, 1.55¢ @ 1.60¢; Flange, 1.65¢ @ 1.75¢; Marine, 1.75¢ @ 1.85¢; Ordinary Fire Box, 1.85¢ @ 1.95¢, and Railroad Fire Box, 2¢ @ 2.15¢. The Sheet trade continues very quiet, but an improved demand is expected early in the new year. We make nominal quotations as follows: No. 24 Soft Steel Sheets, 2.40¢; No. 26, 2.50¢, and No. 27, 2.60¢.

Structural Material.—It is understood that the order for the Beams and Channels for the new building of the Westinghouse Electric & Mfg. Com-

pany, at Brinton, which involves considerable tonnage, has been placed. It is hardly necessary to add that Pittsburgh has taken it. A large amount of Iron and Steel products will be used in the construction of these buildings, all of which will doubtless be taken by Pittsburgh makers. While we repeat quotations of last week, it should be noted that these continue to be shaded, according to desirability of order. We quote Beams and Channels up to 15 inches, 1.45¢ @ 1.60¢, according to size of order; Angles and Universal Plates, 1.45¢ @ 1.50¢; Tees, 1.70¢ @ 1.75¢. A large buyer claims to have placed an order for Universal Plates recently at 1.25¢ at mill.

Muck Bars.—We continue to quote \$20.50 @ \$21, delivered at buyer's mill, for standard grades. Off grades of Muck Bars are offered here at prices considerably lower than the above.

Rails.—It is claimed that some business is in sight and will be placed early in the year. Prices are on the basis of \$24 at mill for standard sections.

Bars.—The condition of the Bar Iron trade is extremely unsatisfactory and the outlook for any improvement to come soon is far from encouraging. The demand is very light, and with the mills all anxious to get orders, prices have been forced to a point that certainly precludes any profit to the maker. While it is true that both labor and fuel are materially lower, it is more than probable that this saving has been more than offset by the reduced prices at which business has recently been placed. It is intimated that the Valley mills will ask for a further reduction in boiling sufficient to put them on an equal basis with non-union mills in the Pittsburgh district. We quote Soft Steel Bars at 1.30¢, with Bar Iron extras. Iron Bars may be quoted at 1.25¢ @ 1.30¢, at Valley mills, half extras.

Wire Rods.—We quote at \$24 @ \$24.50 at maker's mill. The falling off in the demand for Wire Nails has similarly affected the demand for Rods to some extent.

Merchant Steel.—While the demand is restricted, makers expect an improvement in this direction early in the year, when consumers have completed repairs and stock taking. Prices continue low and are ruling as follows: Bessemer Machinery, 1.50¢; Open Hearth Machinery, 1.75¢; Machine Straightened Tire, 1.65¢; Sleigh Shoe, 1.80¢ @ 1.90; Toe Calk, 1.95¢ @ 2.05; Open Hearth Spring, 1.85¢ @ 1.90¢; Tool Steel, 5½¢ and upward, according to quality.

Skelp Iron and Steel.—The demand continues very light, with prices ruling about as follows: Grooved Steel Skelp at 1.10¢ @ 1.15¢; Sheared, 1.20¢ @ 1.25¢; Grooved Iron Skelp, 1.30¢ @ 1.35¢; Sheared, 1.45¢ @ 1.50¢.

Wire Nails.—The demand continues light, although the recent declines in prices have stimulated buying to some extent. It is believed that after the first of the year there will be a material improvement in demand, as it is known that some large buyers are holding off placing orders until next month. We quote Wire Nails at \$1.10 @ \$1.15 in carload lots, according to order. For less quantities \$1.25 @ \$1.30 is obtained. Cut Nails may be quoted at 95¢ at mill for carload lots with the usual averages.

Barb Wire.—This trade is feeling the effects of some very low prices made

by certain mills, but which other mills more favorably situated have declined to meet. The demand is light, but has been strengthened somewhat by the recent low prices referred to above. We quote Four-Point Galvanized at \$2.15 in carload lots. It is claimed that this price has been materially shaded in some recent transactions. Painted may be quoted at \$1.75 in carload lots and Plain at \$1.40 in same quantities.

Connellsville Coke.—This week we reduce our quotation on Furnace Coke to \$1.05 per ton of 2000 lb, f.o.b. cars in Connellsville region. This price is being openly named by the producers and it is claimed has been shaded a few cents on some contracts recently made for Furnace Coke for delivery during the first half of 1894. The established prices on Foundry Coke of \$1.30 to dealers and \$1.45 to consumers are not being observed, but are being freely shaded. For the week ending December 16 there were 8430 ovens in the Connellsville region active and 9083 idle, with a total estimated production for the week of 80,385 tons.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 27, 1893.

Pig Iron.—Local Coke is in comparatively good demand. The usual carload trade is moving and a few contracts have been made for delivery the early months of next year, while the prospects are favorable for much more business of the same character. The Sidney Furnace is now in blast, having started on the 11th. Southern Iron is quiet and Lake Superior Charcoal seems neglected. Quotations are now as follows for cash:

Lake Superior Charcoal.....	\$15.50 @	\$16.00
Local Coke Foundry, No. 1....	13.00 @	13.50
Local Coke Foundry, No. 2....	12.50 @	12.75
Local Coke Foundry, No. 3....	12.00 @	12.50
Local Scotch.....	13.50 @	14.00
Ohio Strong Softeners No. 1....	15.50 @	16.00
Southern Silvery, No. 1.....	@	13.75
Southern Silvery, No. 2.....	@	13.25
Southern Coke, No. 2.....	12.15 @	12.40
Southern Coke, No. 3.....	11.65 @	11.90
Southern, No. 1, Soft.....	12.40 @	12.65
Southern, No. 2, Soft.....	11.65 @	11.90
Tennessee Charcoal, No. 1....	16.00 @	16.50
Southern Gray Forge.....	10.60 @	10.85
Alabama Car Wheel.....	18.25 @	18.50
Jackson County Silvery.....	16.00 @	16.50
Other Ohio Silvery.....	15.00 @	15.50

Bars—Within the past few days a better inquiry is perceptible for both Iron and Steel Bars, but the inclination of buyers seems to be still more strongly in favor of Steel. The very low prices now prevailing for Steel Billets are enabling the ordinary Bar mills to turn their attention more and more to Steel, and they prefer to roll it. Current quotations from near by mills are from 1.30¢ to 1.35¢, Chicago, for either Iron or Soft Steel, but these prices are shaded on good specifications. Some lots from stock are selling at 1.55¢ @ 1.65¢, according to quantity.

Structural Material.—The announcement was premature that the contract for the Milwaukee Viaduct had been awarded. Action remains to be taken by the City Council to make the matter official. The week has been quiet in Building and Bridge Material, although a considerable amount of business is in sight. Quotations are as follows, Chicago delivery: Beams, 1.65¢ @ 1.75¢; Tees, 1.90¢ @ 2¢; Angles and Universal Plates, 1.60¢ @ 1.65¢. Small lots are sold from stock at an advance of 10¢ @ 15¢ per 100 above these prices.

Plates.—A moderate business has been done in small lots from mill and from stock. Mill shipments, Chicago delivery, are quotable as follows: Tank Steel, 1.55¢ @ 1.65¢; Shell Steel, 1.75¢ @ 1.85¢; Flange Steel, 1.95¢ @ 2.05¢; Fire Box, 2.75¢ @ 5¢. Store prices now prevail as follows: Iron or Steel Sheets, Nos. 10 to 14, 2¢ @ 2.10¢; Tank Steel, 1.90¢ @ 2¢; Shell Steel, 2.20¢ @ 2.40¢; Flange Steel, 2.50¢ @ 2.65¢; Boiler Tubes, 70 and 5 % off.

Sheets.—Black Sheets are dull, with prices unchanged at 2.65¢ @ 2.70¢, Chicago, for mill shipments of No. 27 Common Iron, with the price of Steel Sheets approaching more closely to that of Iron. Small lots from stock are selling at 2.90¢ @ 3¢ for Iron. Large inquiries are in the market for Galvanized Iron, while prices are a little weaker. Mill shipments of Juniata are quoted at 75 and 5 % off, while small lots from stock sell at about 70 and 10 % Sheet Copper is fairly firm at 25¢ @ 30 % off, according to quantity.

Merchant Steel.—Nothing new has transpired in this line, and quotations are unchanged.

Billets.—Freights from Eastern points of shipment have evidently been cut recently, as very low prices have been made by Western Pennsylvania and Ohio works for delivery at Indiana mills and other consuming points in this territory. Nominal prices are unchanged at \$19.25 @ \$19.50, Joliet, but actual rates depend on the competition which has recently developed.

Rails.—Considerable tonnage of Steel Rails has been entered for next year, but the quantity is not as large as for previous years at this time. Individual roads, however, are placing contracts for about the same tonnage as before. Prices are firm at \$25 @ \$27, according to quantity. Splice Bars are unchanged at 1.55¢ @ 1.60¢; Track Bolts with Hexagon Nuts, 2.55¢ @ 2.60¢ and Spikes, 1.90¢ @ 1.95¢.

Old Rails and Car Wheels.—No new business has transpired under this head.

Scrap.—Business is extremely dull and quotations are unchanged: No. 1 Forge, \$11; No. 1 Mill, \$8.25 @ \$8.50; Sheet Iron, \$4.50; Pipes and Flues, \$8; Axles, \$16; Horseshoes, \$11; Fish Plates, \$12; Spikes and Bolts, \$10; Cast Borings, \$4.50; Wrought Turnings, \$6.50; Axle Turnings, \$8; Heavy Cast, \$9.50; Stove Plate, \$7.75; Malleable Cast, \$8; Mixed Steel, \$7, gross ton; Leaf Steel, \$14.50.

Metals.—Lake Copper is quoted at 11¢ for carloads, and Casting Copper at 10¢, but the demand is very light. Spelter is weak, and offers have been made by sellers down to 3.40¢ without inducing business. Lead is firmer and is now quoted at 3.10¢, but very little business is doing.

Rogers, Brown & Merwin, dealers in Pig Iron, Steel and Coke, Monadnock Block, Chicago, have issued a very pretty wall calendar for 1894. In connection with it they have distributed an interesting circular entitled "Forecast of 1894 in the Light of Past Records," in which they predict a substantial increase in the consumption of Pig Iron.

Andrew Hawthorne has been appointed Chicago representative of Matthew Addy & Co. of Cincinnati, succeeding W. C. Hayward. The office of the firm has been retained in The Rookery.

Charles H. Hawkins, 205 Western Union Building, Chicago, agent for the Brown, Bonnell Iron Company, has distributed among his patrons a daily memorandum calendar for 1894, which forms a very convenient article for desk use.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., December 26, 1893.

Pig Iron.—So far as new business is concerned there is practically none, everything being closed for the year or as near to it as possible. What the coming year will bring with it is an unsolved problem, and as regards the Iron trade there appears to be no data upon which to attempt its solution. All that is positively known is that prices are at the lowest on record, while the demand is relatively smaller than ever before. On general principles it is supposed that there must be a change soon, but how or when it is to come no one appears to know, and in the sense that there is no inclination to break away from the monotony, it may be said that no one seems to care. Usually when prices are known to be down to cost, or below it, there is a good deal of investment buying and things get a start in that way, but with the exception of a few lots of Pig Iron, variously stated at 25,000 to 60,000 tons, nothing of that kind has been developed. Assuming that 60,000 tons has been so taken the total cost would still be less than \$500,000, which cannot be considered a very extensive operation. Apart from this consumers have shown very little interest in the market. Some have bought to cover the first three months' requirements, but the majority are taking hand to mouth lots, which, in fact, corresponds with their orders; that is to say, they have no orders of any account except such as are sent in from day to day. On the other hand, sellers are not particularly anxious to fill their order books at such prices as the market would afford, so that there is a tacit understanding on both sides to let the market take its course. The collapse of the Crane Iron Company is no surprise to any one and is not likely to have any very serious results. The total stock on hand is less than 8000 tons of all grades, largely Bessemer and misfit Iron, and as there is no probability of its being forced on the market, there is no danger in that direction, and in any case the quantity is too small to do much harm. As regards to-day's prices, it cannot be said that there is any change from last week, but the market is so narrow that it is impossible to form any very definite opinion, although the chances are that on the right kind of offers good buyers could obtain concessions. It will take a week or two to test the position, but the feeling is anything but confident or hopeful.

Steel Billets—No demand at all. Bills of \$19, delivered to near by mills, have been asked for, but as there is no immediate use for the article consumers make no response.

Finished Material.—Prices are no better, but as there is no business to make it worth while to quote lower figures, the market may be called unchanged. At the same time manufacturers are pretty well convinced that if they wish to secure such business as there is they must keep very close to bottom figures, and if the inquiry is for anything fairly attractive they must

do even better than that. Competition is closer than ever, and as there seems to be no immediate prospect of improved demand it is not unlikely that 1894 will start in at lower figures than any that were accepted in 1893. The great want is more business; buyers' wishes could be met in regard to prices. All the mills are hungry for work, but there is very little prospect of its being forthcoming for a while at all events.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, December 27, 1893.

There has been practically no business in the Iron market during the week, there being no inquiry for large lots for either present or forward delivery, and even the jobbing foundries have taken very few single carload lots either in this district or in the East. The tone of the market is weak, and especially for foundry grades of Coke Iron; and while there is little urgency to sell, there are indications cropping out now and then which indicate a desire on the part of some furnaces to secure orders, but Gray Forge is in a firmer position, for it is more generally well sold in advance of production. The shipments of the furnaces on old orders have been less liberal this week, and the melting of Iron appears to be much reduced, so many consumers have already contracted for Iron enough to last them much longer than they anticipated and will not be in the market for many weeks. The price of No. 1 Foundry Coke is \$9; No. 2 do., \$8; No. 3 do., \$7.50; and Gray Forge, \$7 7/8 ton, f.o.b. Birmingham. Charcoal Irons are merely nominal. Quotations are as follows:

Foundry.

Southern Coke, No. 1	.....	\$11.75 @ \$12.00
Southern Coke, No. 2	.....	10.75 @ 11.00
Southern Coke, No. 3	.....	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	.....	14.50 @ 14.75
Lake Superior Coke, No. 1	.....	15.00 @ 15.25
Lake Superior Coke, No. 2	.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	.....	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	.....	17.50 @ 18.00
Tennessee Charcoal, No. 1	.....	14.00 @ 14.25
Tennessee Charcoal, No. 2	.....	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Forge.

Gray Forge	.....	9.75 @ 10.00
Mottled Coke	.....	9.50 @ 9.75

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, December 27, 1893.

Pig Iron.—The demand during the past week has been remarkably light, and prices are weaker in consequence. There is no buying of any consequence for forward delivery, consumers having evidently concluded that prices will go even lower than at present quoted. The outlook is not encouraging, and a lower range of prices will soon be in order. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	.....	\$13.25 @ \$13.50
Southern Coke, No. 2 Foundry	.....	11.50 @ 11.75
Southern Coke, No. 3 Foundry	.....	10.75 @ 11.00
Southern Gray Forge	.....	10.25 @ 11.50
Southern Car Wheel	.....	17.25 @ 18.25
Lake Superior Car Wheel	.....	16.50 @ 17.00
Ohio Softeners	.....	16.00 @ 16.50

Bar Iron.—There is very little business doing in Bar Iron, and prices continue weak and unsettled. Mills quote 1.35¢, half extras, f.o.b. St. Louis, which prices would be shaded for large quantities. Jobbers continue to quote 1.70¢ @ 1.80¢, according to quantity.

Barb Wire.—The sales of Barb Wire have dwindled down to almost nothing, and prices are weaker and quoted lower. Mills quote Painted at \$1.90, Galvanized at \$2.30, and carload lots 5¢ 7/8 hundredweight less.

Wire Nails.—According to the reports, Nails are being given away almost at \$1.30. Some sales have been made, but buyers' views do not get much beyond \$1.20.

Rails and Track Supplies.—There is no improvement to note in this department and prices are unchanged, as follows: Splice Bars, 1.65¢ @ 1.70¢; Spikes, 1.95¢ @ 2¢; Bolts, Square Nuts, 2.40¢; with Hexagon Nuts, 2.50¢; Links and Pins, 1.85¢ @ 1.90¢. Old Iron Rails are unchanged at \$13.50. Steel Rails are inactive at \$26.50 @ \$27.

Pig Lead.—It seems impossible to sell this metal even at to-day's low prices. Consumers refuse to buy, and state that even at lower prices they are not in the market at this time. A few carloads have changed hands at 3¢ @ 3.05¢.

Spelter.—At 3.40¢ there is little or no business doing and with the exception of an occasional carload order there is practically nothing doing.

Financial.

The end of the year 1893 is of a piece with its past unfortunate record. Its closing weeks have witnessed further disasters in the financial world, of sufficient magnitude to stamp any ordinary period as particularly calamitous. Within the past few days the failure of the St. Nicholas Bank of New York City, the declared bankruptcy of the Atchison, Topeka & Santa Fé Railroad and the hourly anticipation of a similar eventuality in the New England road, together with the increasing unfavorable returns of railroad earnings for the present month, have all contributed to give a rude shake to confidence and to depress the spirits of the business community. Usually at this season the disposition is shown in Wall street to contract operations in order to adjust accounts, and this causes a lull in business during the holiday period. But at the present time these features are more strongly marked than ever before. Except in a few stocks, and in cotton, speculation is absolutely stagnant, while general trade is far below the average.

The financial world and the business community generally await with great interest and considerable nervousness the developments likely to occur on and after the dreaded 1st of January. The inability to obtain funds to meet obligations then due has been the main cause of the recent large failures, and this may operate to bring down further concerns similarly placed; for, notwithstanding the plethora of money in the banks, bankers, in view of the expected strain of the January settlements on the commercial community, are using considerably more discrimination in the matter of collateral for loans, while they show great conservatism in the purchase of commercial paper. In a word, the year closes gloomily. Trade and industrial reports indicate extremely dull business, nor can any improvement

be looked for until after the turn of the year. Many concerns close for the holidays under ordinary conditions, but the number of them so suspending operations this season is larger than usual, and with many of them it seems to be a question whether they will reopen after the new year begins or remain indefinitely idle.

Railroad earnings reported for the second week of December show an increasing ratio of loss over those of the last few years, in spite of rigid economies in working expenses. According to the *Financial Chronicle* the earnings of 69 roads for the first and 57 for the second week of December show a loss of 12.2%. *Dun's Review* for about the same number of roads exhibits a loss of 13% in trunk lines, 24.5% on Western "granger" roads, 14% on other Western, and somewhat less on Southern and Pacific roads. The failures of the week number 344 in the United States, as against 285 last year, and include several of importance, the total liabilities exceeding \$6,220,000 in amount. The returns of the bank clearing houses give little or no evidence of any improvement in business activity. The figures of seven of the leading cities show an average decrease, compared with last year, of 32.6%.

The weekly statement of the Associated Banks, issued on Saturday, shows a further accumulation of currency at this center. The amount of surplus reserve increased \$1,768,950, the total now standing at \$78,000,000. Loans expanded only \$865,100, an unfavorable sign, which indicates a check to reviving enterprise. It is pointed out that the loans now stand \$82,500,000 below the deposits, "which shows still an extraordinary disparity between the wants of borrowers and the abilities of the banks to lend." Money on call continues extremely easy on a 1% @ 1 1/2% basis, with more noticeable activity in the demand. Renewals generally rule at the same rate. Time loans on good stock collateral are in abundant supply at 2% @ 2 1/2% for short loans and 3% @ 3 1/2% for longer terms.

Mercantile paper is dull, in consequence of the scarcity of first-class offerings. Such lines of good grade as come into the market are readily absorbed. The current rates are 3 1/2% @ 4% for indorsed bills receivable, 3 1/2% @ 4 1/2% for choice single names, and 5% @ 5 1/2% for names not so well known.

Preparation for the Christmas holidays and the general torpidity of speculation marked the close of last week as particularly dull and heavy in the Stock Exchange. The failure of the St. Nicholas Bank, although having little immediate effect on an already depressed market, gave an added element of discouragement, the uneasiness being intensified by disquieting rumors regarding the Atchison and New England railroads, the stocks of which broke heavily on Friday and Saturday. Other railroad issues fell in sympathy, the market closing feverish on Saturday, with evidence of considerable selling on the part of frightened stockholders. Monday's holiday was succeeded by a somewhat larger volume of trade on Tuesday, notwithstanding the absence of London business. The interest centered mostly in Atchison and New England securities, announcement having been made of the collapse of the former railroad, and indications pointing to the certainty of a similar result for the latter. Heavy liquidation oc-

curred in both cases, New England, especially, falling to panic prices; and other railroad and industrial stocks being more or less affected. The market closed weak and feverish, with a downward tendency in prices. The following list shows the extreme fluctuations of the more active stocks during the week, with closing prices on December 27:

	High- est.	Low- est.	Closing, Dec. 27.
Am. Sugar Ref.	83½	79½	81½
Atchison, T. & S. Fe.	17½	13	13½
Balt. & Ohio.	71	68	68½
Chicago Gas.	64	60	61½
Chic. B. & Q.	76½	73½	74½
Chic. Mil. & St. Paul.	60	56½	58
Chic. Rock Isl. & Pac.	67	63	63½
Del. & Hudson.	130½	127½	129½
Del., Lack & Western.	161½	157½	162½
Gen. Electric.	37½	31½	33
Lake Shore.	123½	121½	123
Louisville & Nashville.	49	43½	43½
Manhattan.	126½	122	122½
Missouri Pacific.	22½	21	21½
National Lead, Common.	23½	21½	22½
New Jersey Central.	115½	112	112
New York Central.	100	97½	98½
N. Y., L. E. & Western.	14½	14½	14½
N. Y. & New England.	22½	12	13½
Northern Pacific, Pfd.	20½	18½	19
Philadelphia & Reading.	19	17	17½
Richmond & West Pt., Term.	2½	2½	2½
St. Paul & Omaha.	37	34½	34½
Union Pacific.	19½	17½	18
Western Union.	85	81	82½

Government bonds have been dull and steady, with small sales on Tuesday of the 4s at 114 for the coupon and 113 for the registered bonds. The latest quotations were as follows:

	Bid.	Asked.
2s, 1891, registered.	95	.....
4s, registered.	112½	113½
4s, coupon.	114	114½

A considerable decline has occurred in the demand for railroad and miscellaneous bonds for investment. The market has been weaker, and in most issues prices have declined. Atchisons depreciated materially in value on the notice of the receivership, and general business has been light.

Sterling exchange has been dull and somewhat weak. An accumulation of commercial bills on Tuesday was fairly met by the demand for remittances, but the London Exchange being closed little foreign business was done. Rates are slightly lower than those ruling last week. Actual business was done at the close yesterday at 4.83½ @ 4.84½ for 60 days, 4.85½ for demand, 4.86 for cables and 4.82½ @ 4.82½ for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial 125 discount, bank par; Charleston, buying ½ discount, selling ½ premium; San Francisco, sight 10, telegraph 15 premium; Savannah, buying ½ discount, selling par @ ½ premium; St. Louis, 50 premium; Chicago, 80 premium.

Bar silver closed in London on Wednesday at 32½ pence, and in New York at 69½¢ per ounce, a fall of ⅜¢ penny and 1 cent, respectively, from the prices reported last week.

A part of the famous collective exhibit of the Swedish iron and steel works at the World's Fair is now being exhibited by N. Lillenberg of 150 Broadway, New York, at the Grand Central Palace. It embraces the articles shown by the Söderfors and Osterby works. The former make pig, Walloon and Lancashire bars and particularly open hearth steel and castings. The Osterby Works produce the famous Dannemora Double Bullet bars, blister and shear steel, and make the line of Dannemora and Dora crucible steels,

the latter including tungsten steel. Mr. Lillenberg also shows the Wanner flexible steel wheel.

Metal Market.

Copper.—Business has been of distinctly routine character and the demand at present is extremely tame. The offering is also reserved, and, except on Metal Exchange contracts, prices below those named by the leading producers or their agents are extremely few and far between. There is, however, enough of what is commonly termed "outside" offering to keep values in more than usually uncertain form. Fair quotations appear to be about 10½¢ @ 10½¢ for Lake Superior Ingot, 9½¢ @ 10¢ for Electrolytic and 9½¢ @ 9½¢ for ordinary casting stock, according to brand and delivery.

Pig Tin.—Prices have remained almost stationary and the market is still bare of distinctly new feature, since speculation is virtually at a standstill, while consumers' purchases, to all accounts, are barely up to the average for the season. Steady inroads are being made upon jobbers' stocks, however, and free or unbonded stocks are in such shape that it is difficult to buy lots of 10 tons or more at 20.55¢ @ 20.60¢ for delivery this month or next.

Pig Lead.—Prices have been moved a little higher, but the leading brokers note no sales of importance and profess to be ignorant of any conditions that should bring about an increase in the value of the metal. In other quarters it is intimated that the advance is purely speculative, and that the speculative backing to the market is of very doubtful endurance. For the present 3.25¢ upward is quoted for ordinary Western brands in carload or larger lots.

Spelter.—Dealings have been on a very moderate scale. The demand has continued moderate also. While not particularly large, the offering has proven sufficient to keep prices rather soft at about 3.70¢ @ 3.75¢ for common, 3.80¢ for prime and 3.85¢ @ 3.90¢ for choice brands in carload or larger lots.

Antimony.—Except of small parcels there are few sales making and prices are easy, with 9½¢ @ 9½¢ quoted for Hallet's, and 10¢ @ 10½¢ for Cookson's, as to size of lot.

Tin Plate.—There has been hardly any buying of late and the demand at present is extremely tame. Prices are somewhat soft on both prompt and future deliveries, but show no radical changes. Spot quotation are as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., \$5.30; Bessemer full weight, \$5.30; light weights, \$4.85 @ \$4.90 for 100 lb, \$4.80 for 95 lb, \$4.62½ for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60; Siemens Steel, IC basis, \$5.65; LX basis, \$6.75 @ \$6.80. Charcoals—Melyn grade, IC, \$6.35; Crosses, \$7.87½; Allaway grade, IC, \$5.60; Crosses, \$6.75; Grange grade, IC, \$5.75; Crosses, \$6.85. Charcoal Terns—Worcester, 14 x 20, scarce; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.35 @ \$7.37½; do., 20 x 28, \$14.75; Dean grade, 14 x 20, \$5.35; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.35; do., 20 x 28, \$10.50; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.60; do., 20 x 28, \$8.87½.

New York.

Office of *The Iron Age*, 95-102 Reade street, New York, December 27, 1893.

Pig Iron.—Current business is very light, nor is any movement expected in the near future. Considerable work is coming up for the Pipe foundries in New England and locally. Contracts at Providence recently taken were at very low prices. We quote: Northern brands, \$13.75 @ \$14.50 for No. 1; \$13 @ \$14.25 for No. 2; \$12 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13 @ \$14 for No. 1; \$12 @ \$13 for No. 2; \$11.50 @ \$12.25 for No. 3; \$11.75 @ \$12.25 for No. 2 Soft, and \$12.25 @ \$12.50 for No. 1 Soft. Gray Forge is \$11.25 @ \$12.

Ferromanganese.—It appears that since October shipments from New York and Baltimore have been made to English, Scotch and Continental ports to the aggregate amount of about 2000 tons, the seller being a Pittsburgh concern. It is supposed that the sales were made to clear up a surplus and were made possible through the fact that the English furnaces were idle on account of the coal strike, and then the European market was held up through a combination. It is estimated that \$46 is what they netted to the American producers. The English furnaces, which are now about to start again, have put down their home prices (which have been considerably above their export price) to exclude further American imports. It is quite clear that, under the circumstances, American producers have full control of this market, and that foreign Ferromanganese has little chance for the present unless foreign manufacturers make very favorable contracts. We quote: Spiegeleisen, 10 % @ 12 %, \$21.50 @ \$22, and 20 %, \$25.50 @ \$26, on cars, Jersey City.

Billets and Rods.—This market is exceedingly dull. We quote nominally: Domestic Billets, \$19.25 @ \$22, and foreign Billets, \$28 @ \$28.50, tidewater; domestic Wire Rods, \$26.75 @ \$28, and foreign Rods, \$39 @ \$39.50, tidewater.

Steel Rails.—No new business of any consequence has been taken in this territory, which is pretty well cleared of all important orders from the larger lines. We continue to quote \$24.80 at tidewater.

Track Material.—We quote as follows for small lots: Spikes, 1.70¢ @ 1.90¢; Fish Plates, 1.25¢ @ 1.40¢; Track Bolts, Square Nuts, 2.10¢ @ 2.40¢, and Hexagon Nuts, 2.30¢ @ 2.50¢, delivered. Concessions would be made for round lots.

Manufactured Iron and Steel.—The week has been exceedingly dull and no transactions of any consequence have taken place. For the immediate future little new work is offering. Manufacturers complain that specifications are coming in tardily. Thus the Brooklyn Bridge terminals have not yet been given out. Foreign Beams are offered at figures even lower than any recorded thus far. We quote nominally: Beams up to 15-inch, 1.65¢ @ 1.80¢, 20-inch, 1.80¢ @ 2¢, 24-inch, 2¢ @ 2.25¢, for round lots; Angles, 1.55¢ @ 1.75¢; Universal Mill Plates, 1.50¢ @ 1.65¢; Tees, 1.75¢ @ 2¢; Channels, 1.65¢ @ 2¢, on dock. Steel Plates are 1.45¢ @ 1.60¢ for Tank; 1.60¢ @ 1.90¢ for Shell; 1.90¢ @ 2.15¢ for Flange, and 2.25¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.45¢ @ 1.9¢, on dock, and Common 1.35¢ @ 1.50¢; Soft Steel Bars are 1.45¢ @ 1.70¢; Scrap Axles are quot-

able at 1.65¢ @ 2¢, delivered; Steel Axles, 1.65¢ @ 1.90¢, and Links and Pins, 1.65¢ @ 1.80¢; Steel Hoops, 1.70¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72½¢ @ 45-lb bundle, at mill; Machinery Steel, 1.45¢ @ 1.50¢; Toe Calk, 1.90¢ @ 2¢ and Sleigh Shoe, 1.65¢ @ 1.75¢, delivered.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, December 27, 1893.

Pig Tin prices have varied in a very slight degree only, and business in the metal has been on a very small scale, chiefly in forward deliveries. That the undertone is rather weak has, however, been evidenced in the fact that prices softened upon the least sign of pressure, and there seems also to be a fear that heavy supplies in the immediate future will have some adverse influence. In any event, buyers are holding off and awaiting developments. The market at the close was £74. 15/, with Straits quoted at £75. 12/6 for prompts, and £76. 15/ @ £77 for three months futures.

Copper prices have varied in a very moderate degree only, or between £43 and £43. 2/6 for Merchant Bars, for prompt delivery, and business has continued on a very moderate scale, with hardly any outside speculative interest manifested. Latest dealings were at £43 for Merchant Bar prompts, £43. 10/ for futures and £46. 10/ @ £46. 15/ for Best Selected English.

Tin Plate has met with slow sale and the negotiation is at present of strictly holiday season character. Prices are still rather weak but not absolutely lower. Liverpool quotations are as follows:

IC Charcoal, Alloway grade.....	12/3 @ 12/9
IC Bessemer Steel, Coke finish.	11/3 @ 11/6
IC Siemens " " " " " " " " " " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20.....	11/8 @ 11/6
Charcoal Terne, Dean grade.....	10/9 @ 11/

Pig Lead has undergone hardly any change in price and the market is still rather uncertain in tone, with £9. 10/ generally quoted for soft Spanish, prompt delivery.

Spelter has fluctuated in price to a moderate extent only, and the market remains bare of distinctly new feature. Present quotations are on the basis of £16. 12/6 for ordinary Silesian.

In the market for Iron and Steel there is nothing to note except that business has been on a very moderate scale and that movements in prices have continued narrow. Last transactions in warrants were at 43/5 for Scotch, 35/6 for Cleveland, and 45/6 for Hematite.

The London Iron and Coal Trades Review states that C. B. Holland is now in this country inquiring into the affairs of the Otis Steel Company of Cleveland, with a view to reorganization.

The many friends of John Fritz of Bethlehem, Pa., will learn with some solicitude that he has been seriously ill. The latest news is of a more favorable character.

The Homestead Wages.

(By Telegraph.)

The new wage scale of the Homestead Steel Works, which goes into effect January 1, contains even greater reductions than at first supposed. They range from 10 to 65 per cent., and considerable dissatisfaction has already been expressed by the men who suffer most, but no strike is expected. The heaviest reductions are in the 119-inch plate mill, and the new and old prices are as follows. The prices given are for 100 tons: Roller, new rate, \$6, old rate, \$12.75; screw down, new, \$3.70, old, \$9.75; tableman, new, \$3.20, old, \$6.95; hookers, new, \$2.75, old, \$6.08; sweeper, new, \$2.27, old, \$3.45; heaters, new, \$5.25, old, \$9.75. On the following jobs the new rate is as follows: First shearman, \$4.09; second shearman, \$3.41; first leader, \$2.95; second leader, \$2.56; lever pullers, \$2.36; helpers, \$2.27. By way of partial equalization for these cuts a readjustment of positions has been made which will make it possible for the men to make better wages than they would otherwise, but by much harder work. Instead of three eight-hour turns, as previously, there will be two turns of 12 hours each and some men will be dispensed with and others allowed to make their tonnage. Instead of two heaters on a turn having three furnaces each, with one helper, there will be only one heater, who will have all the six furnaces and two helpers. This releases four out of six heaters from their positions and the two who are left will probably make as much as formerly, even at a reduction of nearly 50 per cent. The capacity of the 119-inch mill has been put at 100 tons to a turn of 8 hours, but it is said that it only averages about 80. With a 12-hour turn it is expected to exceed 100 tons.

In the 32-inch mill, which is the armor plate mill, the reduction is said to average 40 per cent. on all the high priced men and to be very slight on all who get low wages. The following figures were obtained: Roller, new wages, \$2 per 100 tons, which is about \$4 a day, old wages, \$150 a month; heater, per 100 tons, new rate, \$2.50, old, \$3.47; first helper, new, \$1.60, old, \$2.66; second helper, new, \$1.10; bottom maker, new, \$1.50, old, \$1.60; chainman, \$1.15, no change; broom off, new, \$1, old, \$1.08; tongsman, new, \$0.95, old, \$1.08; roll tablemen, new, \$1.30; old, \$1.39; regulators, new, \$0.70, old, \$0.77, and shear tablemen, new, \$1.20, old, \$1.28. The armor plate mill operates on 12-hour turns, as do all the other mills except the 119-inch mill. Its average capacity is about 200 tons a turn, and it has made as high as 350 tons.

The principal other departments in the Homestead Steel Works are the 10, 23, 28, 33, 35 and 40 inch mills, which are all operated principally upon structural steel, the two open hearth steel departments and the converting departments. On all the structural mills the cuts are said to range from 10 to 40 per cent. None of the rollers got off with less than a 25 per cent. reduction. The blowers in the converting mill have been changed from a salary of \$125 a month and put on tonnage at \$1 per 100 tons. They can make about \$3 a day at this rate. The change in the wages of melters in the open hearth departments is about the same. Lower paid men of both classes are not cut so heavily.

The wages of all foremen, blacksmiths, machinists, pipe fitters and all other classes of skilled day labor are cut on an average of 10 to 12 per cent. Common labor in the mills is reduced from 14 cents to 11 cents an hour. No reduction has been announced in the wages of pick and shovel laborers, who now get \$1.20 a day. The scale is not based on any product of the plant and is consequently an individual agreement. Wages will not be affected by declines or advances in the selling prices of any of the various products of the Homestead plant. With this new scale in force the concern will be in position to compete more successfully than ever before, and will probably have a material advantage over many of their competitors in cost sheets.

Trade Publications.

THE ZUCKER & LEVETT CHEMICAL COMPANY of 8 Grand street, New York, have issued a circular describing their improved American Giant dynamo for electroplating and electrotyping. These dynamos are of the inverted horseshoe type. The smaller sizes have a laminated field, and the large sizes a special cast iron field. The armatures are of the modified Siemens type, thoroughly laminated to prevent all possible heating due to "Foucault" or eddy currents. The commutators are made of pure drop forged copper, insulated throughout, and with proper care should last a number of years. The dynamo is shunt wound, and so proportioned that it cannot reverse. It is noiseless, and is provided with self oiling bearings.

An evidence of the depression that has marked the shipping industry during the past year is given in the returns of shipbuilding in Baltimore, where only 35 vessels have been built in 1893, as against 61 last year. The registered tonnage of the vessels shows a still larger proportion of decline, being 5589 tons for 1893, compared with 17,277 tons in 1892, and this notwithstanding that the Baltimore builders have greatly improved their facilities and methods.

The Addyston Pipe & Steel Company of Cincinnati sold 3000 tons of cast iron pipe to the city of Milwaukee last week at \$19.85 per ton. The other bidders were the Radford Pipe & Foundry Company of Radford, Va.; the Howard Harrison Iron Company of Bessemer, Ala., and Dennis Long & Co. of Louisville, Ky. The city will use principally 12-inch pipe next year, but the contract covers six sizes.

Measures for the relief of the unemployed this winter are being nearly as urgently pressed for on the other side of the Atlantic as they are in this country. The scarcity of work in English towns was never more marked than at the present time, and distress among workpeople is reported from all parts of the country.

Governor Waite of Colorado, who gained considerable notoriety by his sanguinary speeches in defense of silver some months ago, has been again delivering himself of very warlike sentiments on the same subject. This grotesque Executive is reported as expressing himself at a recent meeting in Denver as being in favor of "fighting for the free coinage of silver at 16 to 1, not all summer, but till hell freezes over." Like Don Quixote, Governor Waite would go any length for his inamorata.

The Minority Report.

The report of the minority of the Ways and Means Committee analyzes in detail the provisions of the Wilson bill so far as it refers to the metal schedule. We quote from it as follows:

The metal schedule presents some features that illustrate in a significant way the illogical character of the bill. Among these may be mentioned the substitution in almost all cases of ad valorem for specific duties; the making free a number of articles called "raw materials;" the disregard of the relations that exist between more and less finished products, and the totally inadequate duties named upon certain leading articles.

Some idea seems to have prevailed in the minds of the majority to the effect that duties should be adjusted in proportion to the advance of the article in manufacture. The idea does not seem, however, to have been very successfully worked out. For example, iron ore is made free, and, reckoning 60 per cent. of metallic iron to a ton of ore, the manufacturer of pig iron is given an advantage as to duties of \$1.35 on a ton on his product. But, on the other hand, the amount of protection thereon is reduced about \$4.50. The ingots, which are the raw material of steel blooms, are made to bear a duty of 25 per cent. ad valorem; the blooms, which are the raw material of steel rails, bear the same duty, and the steel rails, the last finished product, bear the same also. Such incongruities run all through the schedule, and are apparent to any one familiar with the processes and products of iron and steel manufacture.

Free Iron Ore.

That which lies at the base of our iron and steel industry is iron ore. The existing duty thereon is 75 cents per ton. The revenues from its importation aggregated in the last fiscal year over half a million of dollars (\$507,976.19). It is proposed under a tariff bill for revenue only to throw away absolutely every cent of this large revenue by putting iron ore on the free list.

That, however, may be said to be a comparatively small matter in comparison with the effect that the proposed measure will have upon our home industry by the substitution for native of foreign ores, the product of cheap foreign labor.

Our ore industry, from whatever point viewed, is among the most important. According to the census figures of 1890 the production of iron ore for the year ending December 31, 1889, was in excess of fourteen and a half million tons (14,518,041). Its value was more than thirty-three and a third millions of dollars (\$33,351,978). Twenty-six States and two Territories, North, South, East and West, contributed to it. In the amount and value of production Michigan stands first, and whether Pennsylvania, a Middle State, or Alabama, a Southern State, stands second is a question of doubt. The amount of capital invested is nearly a hundred and ten millions of dollars (\$109,766,199) and the number of men directly employed over thirty-eight thousand (33,227). The average annual earning capacity for each person so employed at current wages is \$409.95.

Of course in taking account of the value of this industry to American labor there must be added all the various labor processes, including the transportation, necessary to get the ore from the

hill into the furnace stack. The theorist who talks about "raw material" never permits himself to realize that, as has been well said, "nature rarely dispenses with transportation. She never separates, assort, cleanses and feeds into the hopper or the stack."

The bill proposes to put into competition with American ores foreign ores, some of which are produced at a labor cost one-tenth and none of them at a labor cost greater than one-fourth of ours. It proposes to bring our laborers who get from \$1.60 to \$2 per day, and who work from 55 to 60 hours a week, into competition with laborers who work 72 hours a week and get 36 to 60 cents per day; our miners who get from \$2.25 to \$2.75 per day into competition with those who get from 60 to 75 cents per day.

Pig Iron.

Having sacrificed over \$500,000 per annum of revenue to the vagary of free trade, the "tariff bill for revenue only" proposes to affect another large source of revenue by serious reduction of the duties on pig iron. That duty now is \$6.72 per ton. The duty proposed is 22½ per cent. ad valorem, or about from \$1.60 to \$1.90 per ton, a lower tariff than was ever before proposed on this article. That suggested by the Mills bill was \$6 per ton; under the tariff of 1846 the duty was 30 per cent. ad valorem.

The revenue from pig iron during the last fiscal year amounted to over one-third of a million dollars. While decreased duties will add to importations, it is to be noticed that the difference between present and proposed duties is in the neighborhood of \$5 per ton, and that a large loss of product and a large loss of revenue are both inevitable.

Pig iron, so far as both capital and labor are concerned, is one of our leading industries, and is followed in 23 States of the Union.

In the year 1892 our product was 9,157,000 tons, of a value of \$131,161,039, and the prices at which it was sold to the consumer were the lowest that it ever commanded. The proposed duty will close all New England furnaces and all east of the Alleghanies, as well as those of the South. The market for Southern pig iron is necessarily found in the North, owing to the lack of demand at the place of production. The consequence is that the competition of Southern pig iron, which of all pig irons is made at the cheapest cost in this country, fixes the price in Northern markets. That price is controlled to a large extent by freight rates. Interior freight rates are very heavy as compared with ocean rates. In many cases pig iron comes from England and Belgium as ballast, subject to no freight charges at all. In other cases it bears a burden not to exceed 5 shillings per ton. At this figure it can be carried to the Atlantic and Gulf ports, and even to those of the Pacific. Assuming that our pig iron, made at the least cost, is made as cheaply as that made abroad, which is not true, it amounts to a demonstration that all of our blast furnaces, save those in the interior, must succumb to foreign competition. Even the latter, if able to exist at all, must do so without margin of profit.

The new cruiser "Powerful," which the British Government purposes building, will be 14,000 tons displacement, with engines of not less than 30,000 horse-power and 48 tubular boilers, with four very large stacks. This will

be the first instance of the use of tubular boilers in the British navy in connection with so large a vessel.

The first rice elevator in the world has just been completed at New Orleans for the National Rice Mfg. Company of that city.

CONTENTS.

	PAGE.
The Hodge-Frazier Taper Turning Attachment. Illustrated	1163
Cost Keeping	1163
Basic Bessemer Costs	1164
Practical Application of the Pyrometer	1166
Universal Die and Roll Grinding Machine. Illustrated	1167
Duluth News	1167
The Western Foundrymen's Association	1168
Notes of a Southern Trip	1170
The Kansas City Implement Trade	1171
Duplex Convertible Screw Block. Illus.	1171
The Chicago Horse Shoe Company	1172
Shops of the Fuller Iron Works. Illus.	1172
New Publications	1173
Editorials:	
The Passing of 1893.	1174
Steel for Railroad Ties	1174
Exports of Cast Iron Pipe.	1174
Correspondence	1175
Washington News	1175
Obituary. Portraits	1176
The Week	1177
Manufacturing:	
Iron and Steel	1177
Machinery	1178
Hardware	1178
Miscellaneous	1179
Trade Report:	
Pittsburgh	1180
Chicago	1181
Philadelphia	1181
Cincinnati	1182
St. Louis	1182
Financial	1182
Metal Market	1183
New York	1183
British Iron and Metal Markets	1184
The Homestead Wages	1184
Trade Publications	1184
The Minority Report	1185
Hardware:	
Condition of Trade	1186
Notes on Prices	1186
The Hardware Club	1187
The Hardware Merchants and Manufacturers' Association	1188
Return Postage	1188
Bicycles for 1894	1188
Trade Topics	1189
Trade Items	1190
Newhall Ship Chandlery Company	1191
Price-Lists, Circulars, &c.	1191
It Is Reported	1191
Paints and Colors	1192
Lineman's Plier. Illustrated	1192
The Breck Sap Spout and Cover. Illus.	1193
Princess Curling Iron Heater. Illus.	1193
Immel Door Clamp or Vise. Illus.	1193
The Hallenbeck Hammerless Gun. Ill.	1194
Cloyd's Flooring Clamp. Illustrated	1194
Columbian Folding Curling Iron. Illus.	1194
Cable Adjustable Handle Bar. Illus.	1195
The Darling Filters. Illustrated	1195
Hayes' Safety Kettle Bottom. Illus.	1196
The Yost Tire. Illustrated	1196
Current Hardware Prices	1197
Current Metal Prices	1204

HARDWARE.

Condition of Trade.

THE last week of December is devoted more to preparations for closing the year's business than to active attention to trade, which, except in a few holiday and seasonable specialties, is decidedly light. The matter of making the annual inventory is now in hand with a view to closing the books and estimating the financial results of the year. It is expected that inventories will in most cases show a diminished stock, owing to the conservative policy which has been pursued for the last half of the year, and if the balancing of the books does not show diminished profits there will be reason for exceptional congratulation. Most merchants and manufacturers will, however, probably be confronted by the fact that business during the year was considerably less remunerative than usual, but if their losses were not especially heavy, and they are still in condition for the active prosecution of business in the more prosperous days which it is hoped are before the trade, they have good reason for contentment. The year which is ending will long be remembered as in many respects the most trying one in the experience of the present generation of business men. It, however, draws to a close with the promise of better things in the year to come, and as soon as tariff uncertainties are removed it is hoped that there will be a gradual if not a prompt resumption of normal business activity and profit. The reaction from the curtailment of industry must sooner or later come, and the economies which have been enforced during the hard times will be an excellent preparation for a more healthful and permanent prosperity in which we doubt not the Hardware trade will have full share. We close these weekly reviews of the business situation hoping that it will be our pleasant task to record a more satisfactory and profitable business in 1894, and wishing all our readers a Happy and Prosperous New Year.

Chicago.

(By Telegraph.)

Jobbing houses are now passing through their usual dull holiday season. Salesmen are either at home or on their way home, and mails are light. Most of the houses here are taking stock and are not specially anxious to be troubled with business at this time. Quite a number of salesmen for Eastern Hardware concerns are traveling through this section soliciting orders for the coming year, but they are not meeting with much encouragement. Jobbers will continue their policy of buying from hand to mouth, except when they are actually offered bargains, until they see some indications of prices hardening.

St. Louis.

(By Telegraph.)

There is, practically speaking, no trade. Traveling men are in off the road, making the necessary arrangements for 1894. Stocks are also being arranged for inventory, so that so far as actual sales are concerned the present week will rank among the lightest of the year. Looking back through the year, there is nothing to enthuse over, and it is to be hoped that the turn in trade will come with the turn of the year. Collections are fair.

Notes on Prices.

Wire Nails.—During the past week the volume of business has been light, though it is understood that the low prices ruling have induced the placing of some good orders. The general demand is, however, moderate, the trade not being confident that the lowest prices have yet been touched and deferring their purchases until the opening of the new year. There have been no further developments in the matter of prices, the market being represented as a week ago by the quotation of \$1.10 for carload lots at mill, it being, however, understood that this figure is shaded on especially large and desirable assortments. Some of the mills are understood to be fairly well supplied with orders, but others have a good stock on hand and are stopping or curtailing production. In the present condition of the market large buyers will do well to watch it closely, as there is no doubt that for desirable quantities and assortments and for deliveries more or less prompt they can secure more advantageous prices and terms than a few months ago were deemed possible.

Chicago, by Telegraph.—The Wire Nail trade is reported quiet by the

manufacturers, and there are few large inquiries from buyers, who are holding off until they are convinced that prices are as low as they are likely to go at this time. Some factories are reported so well sold up that they will go into the new year with a smaller stock than ever before. Nevertheless prices are lower and factory lots are now selling at \$1.18½ to \$1.25, Chicago. Small lots from stock are sold at \$1.30 to city trade and \$1.35 to the country.

Cut Nails.—The Cut Nail market is inactive, and purchases are limited by the necessities of buyers. The market in the matter of price is in the same condition as for several weeks, being represented by the quotation of 90 cents for carload lots at mill, a figure which is slightly shaded in the presence of attractive specifications. It is not unlikely that orders especially desirable in the matter of assortment and terms of payment could be placed with some manufacturers at a somewhat lower figure. Small lots from store in New York are quoted at \$1.20 to \$1.25.

Chicago, by Telegraph.—Cut Steel Nails are quiet, with prices nominally unchanged at \$1.15 to \$1.20, according to the character of the order. Small lots from stock are quoted at \$1.25.

Barb Wire.—Barb Wire continues in substantially the same condition as at our last review, being represented by the quotation of \$2.10 for Galvanized and \$1.70 for Painted, with 5 cents off in carload lots. The demand is light.

Chicago, by Telegraph.—The Barb Wire market here has weakened and quotations of Galvanized are now made by manufacturers at \$2.15, Chicago. The break comes from the East and local manufacturers refuse to meet the cut, as they are selling most of their product direct to the retail trade in small lots, for which they are receiving from \$2.30 to \$2.35. Jobbers quote small lots from stock at \$2.50.

Cordage.—In sympathy with reduced prices for raw material and in the presence of continued active competition among the manufacturers and a very light demand, there has been a decline of about ½ cent per pound in the prices of Manila and Sisal Rope, Manila being obtainable in large lots at 7½ cents, and Sisal at 5 cents, terms f.o.b. factory or New York, subject to a discount of 1½ per cent. for cash. New Zealand remains unchanged at 5 cents.

Storm Window Fasteners.—Moore's Storm Window Fasteners, manufact-

ured by True & Blanchard, Newport, Vt., and illustrated in *The Iron Age* December 14, 1893, are packed with screws and sold at \$2.40 per dozen sets, less a discount of 20 per cent.

Door Spring and Check.—Bardsley's Liquid Door Spring and Check, illustrated in *The Iron Age* December 21, 1893, and manufactured by J. Bardsley, 149-151 Baxter street, New York, is sold at a discount of 15 per cent. from the following list:

Size.	Doors.	Each.	Brackets. Extra, each.
A.	2 ft. 9 in.	\$3.00	\$0.25
B.	2 ft. 6 in. to 3 ft.	4.00	.30
C.	3 ft. to 3 ft. 6 in.	5.00	.35
D.	3 ft. 6 in. to 4 ft.	6.00	.40
E.	4 ft. to 4 ft. 6 in.	7.00	.45

Glass.—There appears to be no encouragement in the way of improved prices or demand for factories to go into blast, or for factories already making Glass to continue in operation. This includes both the Sheet Window Glass and Plate Glass industries. Factories are not likely to be continued in operation unless they have orders to work on, as they see nothing to be gained in piling up stock. It is difficult to obtain reliable quotations, but taking the quotations given in our last issue as a basis, there are no indications of any advance, but if anything the market is weaker.

The Hardware Club.

A MEETING of the Hardware Club of New York was held on the 22d inst., in the parlors of the Cosmopolitan Hotel. The attendance was a large and representative one and the gathering was characterized by much interest and enthusiasm. William H. Williams, the president of the Club, occupied the chair, and after calling the meeting to order made the following address:

The object of this meeting was pretty thoroughly stated in the call. It seemed to your Board of Governors that you would naturally be desirous of knowing what are the prospects of getting into the new club rooms, of which you have occasionally heard, and what was to be the character of the home which has been provided for the use of the club. It will be remembered that at the last meeting of the club a resolution was passed directing the Board of Governors to engage rooms for the use of the club in the new building of the Postal Telegraph Company on the corner of Broadway and Murray street. Pursuant to these instructions the top floor of that building was secured for the use of the club. The building has a frontage of 62 feet on Broadway and 148 feet on Murray street, with an L at the western end running back about 90 feet from Murray street. This room was secured at an annual rental commencing at \$9000 for the first year and running up to \$15,000 per year in five

years. It was intended at first that the kitchen should be in the L at the western end of the building. We found, however, that this would not permit the most desirable arrangements for the club rooms, and, at the request of the board, the owners of the building decided to put a kitchen on the roof, with a mezzanine floor between it and the club rooms, at an additional rental of \$900 per year.

Consultation with the architects of the building and other gentlemen familiar with such matters has convinced us that the rooms as arranged in the plan, copies of which are here for the inspection of members, will, in point of convenience, desirability and general adaptability to our needs, be equal, if not superior, to those of any similar organization in the country.

By request of the board, a House Committee was appointed several months ago, consisting of Messrs. Peter McCartee, chairman; E. C. Van Glahn, Eugene Bissell, J. L. Varick and the president, *ex officio*.

This committee has devoted much time to the consideration as to the needs of the club, and is prepared to report to you to-day upon its requirements. I need hardly call your attention to the fact that the amount of detail necessary to suitably furnish a club such as we propose to have is very considerable. The amount required in the various departments, such as tables, chairs, carpets, silverware, glassware, crockery, cutlery, ranges, refrigerators, kitchen utensils, &c., is much more than we at first thought would be necessary.

I may say at this point that after giving the subject careful consideration, your Board of Governors long ago concluded that it would be useless to carry on a club that should not be first class in all of its appointments, and we believed that if we could secure proper rooms, well and centrally located, and fit them up not luxuriously, but comfortably and conveniently, that the club would be supported by the Hardware and kindred trades and such other gentlemen as we desired to associate with us, and that, conducted along such lines, it would soon be in a prosperous financial condition. From this position your Governors do not recede in any degree. Our membership, as will appear from the secretary's report, is upward of 800, and this in face of the fact that we have had no permanent meeting place, and nothing except the future prospects of the club to offer gentlemen as an inducement for them to join with us. We have the assurance of many gentlemen who have been approached upon the subject that they will join the club as soon as it is ready to occupy its permanent rooms. We believe that there are many gentlemen in this vicinity who have not yet been invited to join the club who will

be very glad to do so as soon as we are able to give them the lunching facilities which the club intends to provide. Your board has canvassed this subject pretty thoroughly, and has become convinced that we have excellent reason for believing that within six months after the opening of the rooms our membership will not be less than 400, and that it may reach 500 before the end of the year 1894.

In order that the Board of Governors should not be individually held liable for the rent of the club rooms, an arrangement has been effected with the Postal Telegraph Company, by which, upon the occupancy of the rooms by the club, we shall deposit \$5000, or the equivalent thereof, to be held by our landlords as security for rent. From the initiation fees of our present membership about \$15,000 will be realized. Deducting from this amount the \$5000 to be deposited as security for rent, \$10,000 only will be available from this fund for the purposes of furnishings and fittings, as it is the design of your Governors to reserve the annual dues intact for the necessary running expenses of the club.

In connection with this I would like to say that during the past year the board has given a great deal of time and attention to the investigation and consideration of matters pertaining to clubs such as the one it is proposed to have under the name of the Hardware Club. There are several in this city, as you are well aware, and we have been permitted to confer freely with the officers and managers of most of them in regard to many details which would be of interest to our own organization, and I believe I can say that, without exception, all of those organizations which are conducted on a strictly first-class basis are financially prosperous and are regarded as almost indispensable by their members. It is the ambition of your Board of Governors to make the Hardware Club of New York second to none in point of financial prosperity and general usefulness to its members.

The proprietors of the Postal Telegraph Building have taken a great interest in our club and assure us that so far as it is possible for them to co-operate with us in providing us with elegant accommodations no effort will be spared.

I need not detain you by any argument as to the need of such an organization as ours for our trade and those who are associated with us in the club. The general interest manifested by our membership convinces me that you appreciate those advantages quite as fully as your officers and your Board of Governors do, and I have pleasure in believing that you will loyally sustain those officers and governors in all proper efforts to provide for you a suitable place of meeting, and to place this club upon an enduring basis of prosperity.

To this somewhat general report, I will only add that a committee has recently been appointed to make arrangements for the annual dinner of the club, the date of which will soon be announced.

I now ask your attention to the reports of the various officers and committees to which I have referred.

The secretary read a letter from Mayor Gilroy, in which the latter regretted his enforced absence from the meeting. Mr. Varick then presented his report as secretary. It showed that there were at present in the club 248 resident members and 59 non-resident members, making a total of 307 members, against 228 resident members and 61 non-resident members, a total of 289, for last year. The treasurer's report was then presented by Mr. Keating, who was followed by Mr. McCartee with a report as chairman of the House Committee. Mr. McCartee furnished a detailed estimate of the probable expense of furnishing the club's quarters, and stated that his estimates were based on a daily attendance of 225, although the club rooms were amply sufficient to accommodate from 350 to 400 members at one time.

Mr. Hayden as chairman then submitted the report of the Finance Committee, after the reading of which David Williams offered a resolution in which the action of the Finance Committee was approved and pledging the support and co-operation of the members of the club in the efforts of the Board of Directors looking to the future. Messrs. Newhall, Hamilton, Weaver, Marshall, Leonard, Keating and Bissell spoke in support of the resolution, which was unanimously adopted. Mr. Mitchell then moved a vote of thanks to Mr. Wildey, the proprietor of the hotel, for the use of his parlors, after which the gathering adjourned.

Preparations are already making for the annual dinner of the club, which will be held in the latter part of February, 1894. It was expected that this dinner might be held in the new club rooms, but it is now feared that this will not be possible, as the quarters will hardly be ready in time. A Dinner Committee has been appointed by the president of the club, comprising the following gentlemen: Peter McCartee, E. C. Van Glahn, Eugene Bissell, A. D. Clinch and J. L. Varick. A Sub-committee on Speakers and Toasts has also been selected, consisting of Richard R. Williams, James H. Kennedy and Webster R. Walkley.

The Hardware Merchants and Manufacturers' Association.

AT A REGULAR MEETING of the Philadelphia Hardware Merchants and Manufacturers' Association, held on December 19, the following preamble and resolutions were adopted:

Whereas, The proposed tariff bill prepared by the Ways and Means Committee, so far as it relates to the change from specific to ad valorem duties, on which the cost of goods is not to be estimated at American valuation, but upon inventory prices in foreign countries; and

Whereas, We believe this change will open the doors to great and possible frauds through disguised, fictitious and under valuation upon invoices, and will largely discriminate against the honest American importer; and

Whereas, Many changes in the present duties are proposed, which examination shows most seriously, disastrously and injuriously affect, if not cause bankruptcy to, many of our manufacturing industries, and is a direct attack upon the American workmen, coming at a time when they are suffering from enforced idleness; and

Whereas, We believe these changes must result in diminished trade, reduced wages, add to the unemployed, and thus fall heavily upon the wage earner, and bring distress to a vast number of people;

Therefore, be it resolved, That the Hardware Merchants and Manufacturers' Association of Philadelphia record this emphatic protest against the passage of the Wilson bill as legislation that will retard our industrial progress, jeopardize invested capital, and compel a reduction in the wages of our workmen, which will necessitate a change in their mode of living.

Resolved, That we request the members of Congress, without respect to party, to resist, by every available and lawful means, the passage of this proposed tariff bill.

Return Postage.

MANY MEN who are punctilious in conforming to business usages often in writing letters to which they expect answers fail to inclose stamps to prepay postage on the reply. It would be better still to inclose an addressed stamped envelope with a written address. An inquiry will receive earlier attention and perhaps more careful attention if it involves but little trouble and no expense to the person addressed than if the latter is expected to do considerable work and foot the bill besides. This may seem a small matter—only 2 cents involved—but the principle of the transaction is apt to govern the person who is expected to reply. He is very apt to say to himself, "Well, if this man expects an answer he should at least have inclosed a stamp." There is very little danger of any one taking offense at such an inclosure. The inquirer who hesitates to inclose a stamp to a concern transacting a million dollars' worth of business a year because it is such a trifle may find upon reflection that the existence of that house depends upon an aggregation of two-penny profits.

There are salesmen who at this time of the year are endeavoring to secure positions with other houses, and yet omit the inclosure of return postage on the reply which they unhesitatingly look for to their letter of application. If they receive answers to such unbusinesslike letters they are in luck, and they may be sure that something else has recommended them than their correct observance of business civilities. The amount involved is of no consequence. Even if letter postage should be reduced to a penny, a stamp should still be inclosed to insure a reply.

Bicycles for 1894.

THIRD ARTICLE.

Prices.—Many of the manufacturers are still reticent in the matter of prices, deferring a public announcement until the opening of the new year. It is, however, evident that there will be a wide range of prices, and while some of the machines will be held at the figures which ruled during the past season, many others will be offered at lower prices. Pope Mfg. Company have, however, announced their line of machines and their prices. The standard price of Columbias is reduced to \$125, though some of the lighter machines are listed higher. The line of wheels presented for the coming season, with weights and prices, as more fully referred to below, are as follows:

Columbia Model 34, 30, or 29 pounds without brake	\$125
Columbia Model 35, 37 pounds, ladies' wheel	125
Columbia Model 36, 37 pounds	125
" " 37, 21½ "	150
" " 38, 31 "	125
" " 39, 35 "	140
" " 33, 19½ "	160

Manufacturers' Announcements.—We give below further advice in regard to the lines of wheels which will be put on the market during the coming season, and in future issues shall refer to the product of other manufacturers and the changes in their line for 1894:

THE POPE MFG. COMPANY, 221 Columbus avenue, Boston, have issued their 1894 catalogue, describing and illustrating the Columbia Bicycles. It is comprehensive and artistic, showing not only wheels, but many pleasing views of Bicycle riders, together with illustrations of Bicycle parts and methods of construction. The company offer no wheels made in previous years, but all the wheels are new, and the line is large and varied. Two special machines for tall riders and a light, well equipped wheel for ladies are also shown. Among their specialties are a new light pedal, the new Hartford double tube tire, and the adoption of wood rims on some of the lighter wheels. The company remark that careful provision has been made for filling every reasonable requirement as to style, construction, size, lightness, strength and equipment, so that purchasers of high grade machines may select from their stock Bicycles to suit their particular cases. The Columbia Model 34 weighs 30 pounds, or 29 pounds without brake, and is designed for expert and intelligent riders who take care of their mounts even while putting them through hard road

work. This machine lists \$125. The Columbia 35, a ladies' wheel, presents only such minor changes as have appeared desirable to bring it fully up to date. It weighs 37 pounds, but can be stripped to 30 pounds, and lists \$125. Columbia Model 36 is designed as a safe machine for fast and hard work under all riders, and is fitted with loop seat rod, rubber pedals, complete wheel guards and rear wheel brake, thus weighing under 37 pounds, stripped 32 pounds, and lists \$125. Columbia Model 37 is a semi-racer particularly built for track work and for road racing under reasonable conditions. It is fitted with wood rims, weighs 21½ pounds and lists \$150. Model 38 is practically identical in its details with their Model 34, with extra high frame substituted for the regular size, affording a minimum reach of about 37 inches as against 32 inches in Model 34. This can be readily increased to meet the requirements of taller riders by moving up the L-rod or by substituting the loop seat rod. The machine with brake weighs 31 pounds, or 1 pound less without brake, and lists \$125. Model 39 is another machine particularly designed for very tall riders, having an extra high frame, with 34-inch wheels, affording a minimum reach with the use of the L-rod of about the same as Model 38, and while its weight is a few pounds greater it carries the rider somewhat higher from the ground. It weighs 35 pounds, listing \$140. Model 33 is a racer constructed with the company's double diamond frame, combining rigidity and lightness. It is fitted with wooden rims, weighs 19½ pounds, and lists \$160.

GENDRON IRON WHEEL COMPANY, Toledo, Ohio, present for the coming season three Gendrons: Roadster, ladies' and scorchers. The roadster, or No. 15, weighs 36 pounds, and is listed at \$130. It has Nos. 16 and 18 gauge tubing in the frame and No. 18 gauge fork blades. No forgings are used in the fork crown, head or crank shaft sleeve. The ladies', or No. 14, wheel has the same gauge tubing in the frame, and has the upper bar reinforced at its lower curve by a telescope 18 inches long. The wheel weighs 36 pounds and lists at \$135. The scorchers, No. 17, has no tubing in the frame lighter than No. 18 gauge, with No. 18 gauge fork blades. There are no forgings in the crown, head or crank sleeve. The machines are all fitted with the Buckeye pneumatic tire, which has an endless air tube completely encircled by the outer cover, and has a bridge across the seam at the base of the outer cover. The outer cover is split at its base and laced all around, but in eight sections, so that when punctured only one section need be unlaced. The manufacturers guarantee the machines to be free from all imperfections in material and workmanship, and will replace any time during the year 1894 all parts which show such imperfection. The guarantee applies to the Buckeye pneumatic tire.

THE AMERICAN ORMONDE CYCLE COMPANY, 135 West 125th street, New York, will offer for 1894 the Ormonde Model G, light roadster, with wood rims, weighing complete 27 pounds; the ladies' Ormonde, the same weight as the gentlemen's wheel, the tubing being of larger diameter than usual, but of lighter gauge. Also a line of Ferris Bicycles, all of which will list at \$100. The gentlemen's wheel will have Humber shaped frame, tangent spokes and steel rims, fitted with Morgan &

Wright, Bidwell or New York Belting & Packing Company's tires. Wood rims will be fitted for \$5 extra. The nickeling and enameling will be, it is stated, as fine as on the best machines. The Ferris scorchers will also list \$100. The ladies' Ferris will be built on the lines of the ladies' Ormonde, and will be fitted in detail the same as the gentlemen's Ferris. The company, it is stated, recognize that the popular price will be \$100 next year, and exerted themselves to produce as fine a wheel for the price as it is possible. Among the cycling sundry novelties, of which they make a specialty, are very light racing pedals and adjustable lamp brackets, a pocket repair outfit, feather-weight bells and miniature lamps.

TWO SPEED BICYCLE COMPANY, St. Charles, Ill., will market a 30 inch gentlemen's wheel with gears 68 and 51, weighing 35 pounds; a 28-inch gentlemen's wheel with gears 63 and 48, weighing 34 pounds; and a 26-inch ladies' wheel with gears 58 and 44, weighing 34 pounds. The machines are shifted from one gear to another without taking the feet from the pedals by turning a small switch lever. The larger sprocket is used when riding on good roads, and the smaller one for hill climbing. The sprocket not in use runs idle, and for coasting the cranks stand still if desired. It is remarked that there is no jerk when the gear is changed.

SURBRIDGE MFG. COMPANY, Hagerstown, Md., will have a line of Cycles for 1894, including the following: America, 28-inch, list \$135; Century America, 28-inch, list \$100; America Girl, 26-inch, ladies', \$100; Young America, 26 inch, boys', \$70, and Kid America, 24-inch, boys', \$50. Their leaders are the \$100 wheels, which are referred to as being high grade in every respect, differing only from the higher priced by being a couple of pounds heavier. Their boys' wheels are built of high grade material and will weigh about 26 and 29 pounds respectively.

The line of Liberty Cycles put on the market for 1894 by WILSON, MYERS & Co., 55 Liberty street, New York, with factory at Rockaway, N. J., consists of seven distinct patterns. The Liberty Bogie Man track racer weighs 19 pounds and lists at \$140; 1894 model Liberty scorchers weighs 28½ pounds and lists at \$125; 1894 model Liberty roadster weighs all on 35 pounds, listed at \$125; 1894 model ladies' Liberty weighs 33 and 37 pounds, listed at \$125; 1893 model Liberty road scorchers weighs 31 pounds and lists at \$110; the Hummer scorchers weighs 32 pounds and lists at \$100, and the Hummer roadster weighs 38 pounds and is listed at \$90. By stripping of mud guards and brake, the machines listed all on can be reduced 3 pounds in weight. The prices given are a total change from any prices the firm had in former years. In this connection they state that they have responded to the call from all over the country for a reduction in price, and that in addition to this they have introduced the two models of Hummer safeties, which are medium grades, and are listed at a price which the makers believe will be taken advantage of by parties of limited means. For 1894 is presented the Liberty detachable pneumatic tire in its improved form. It is claimed that it does not depend upon air pressure to hold it to the rim, and that it is impossible for the tire to creep. A new combination pedal is also introduced for next season,

and all Liberty machines will be fitted with a pedal of the rubber character, which can be converted into the rat trap pattern in a minute's time, which practically gives two pairs of pedals with each cycle. They will continue to use the Liberty patented hub, which is referred to as having given excellent satisfaction in past years. Two heights of frame are built, better adapting the machines to riders both short and tall. Two styles of handle bars will be furnished, one suited for the so called scorchers, who like the stooping position; the other allowing the rider to sit up in a perfectly erect position. The latter is designed more especially for wheelmen of advanced years.

BUFFALO WHEEL COMPANY, Buffalo, N. Y., will sell the following wheels for the season of 1894: Century Niagara, 32 pounds, a high grade Bicycle, listing \$100; Maid of the Mist, 30 pounds, a high grade ladies' wheel, listing \$100; special racing wheel, 15 pounds, built to order, listing \$165; stock Niagara racer, 21 pounds, for track or road racing, listing \$150; semi-racer, 26 pounds, same design as the stock racer, listing \$125; full roadster, weight stripped 34 pounds, 30-inch front and 28-inch rear wheels, for heavy weights, listing \$125, mud guards and brake included; also a Tandem convertible weighing 54 pounds and listed at \$250. In addition the company show a special Bicycle hub and a novelty in sulky wheels, the latter having four sets of spokes.

THE PROVIDENCE TIRE COMPANY, Providence, R. I., are putting a new Tire on the market for 1894. It is known as the Providence Double Tube Tire, and provides for the use of two inner tubes, one drawn through the other. Each tube has an independent valve, and in use the outer one is first inflated, forming an ordinary inner tube Tire. Should this become punctured or the valve get out of order, all that is required is to inflate the reserve inner one, which, when uninflated, lies in the hollow of the rim, fully 1½ inches from the outer surface. Should the second tube become damaged, it can be inflated again by displacing it so the puncture in the two tubes will not be opposite each other; the outer inner tube thus forming a patch for the puncture of the inner inner one. It is stated that the double inner tubes are as easily detached and mended as the single inner ones, and that they do not weigh more than the average single tubes and are much more elastic and lively.

Trade Topics.

Extra 2½ Per Cent.—Mr. B., who represents, among other houses, the manufacturers of Ames' Shovels, was chatting about business with me, writes a Western correspondent, when we touched upon firmness in prices, and he said:

"I always knew that Mr. Ames was pretty stiff in his prices, but I never knew just how firm he was until one time a man who was handling a few goods said to me: 'B., I am ready to give you a \$5000 order for Ames' goods, and I will agree to send another order of equal amount within six months if you will give me a slight concession. I want an extra 2½ per cent.'

"Now, I thought he wasn't asking very much, and I was going to the fac-

tory very soon, so I told him I'd lay the matter before Mr. Ames, and I was pretty sure it would go through.

"Well, sir, do you suppose it did? No, sir.

"Said Mr. Ames: 'It will not do. It would be a mistake. Why, Mr. B., if we allow him an extra 2½ per cent., in less than six months he will be convinced that some other house is getting an extra 5 per cent. and he will be a good deal more dissatisfied than he now is.'

"And," added B., "I am firmly convinced that he was right.

"Mr. ——— and I had been representing the Ames concern several years on the road," continued B., "and had really done but little for the house. Then duller times came and we rather expected that they would have no further use for us, but we went to see them at the proper time, to have it over with.

"'Well, boys,' said Mr. Ames, 'the time has now come when we need your services; as trade has been it did not matter much whether any one mentioned our name on the road or not, but now we want your help.'

"Wasn't that pretty solid sense? We appreciated it and determined we would give him our very best licks that year."

Travelers' Methods. — A Western jobber writes us:

Some traveling men have a way of lingering about the showcase near the door, as if they were looking for something they wanted to buy, thus enticing a man forward to meet them, and then pushing out their card to him. It always makes me mad when I am trapped this way, and the man must have something I am in very great need of to get me to order from him.

I suppose part of the reason is that he gets a man away from his desk, or away from others who may be near him, and secures his undivided attention. But it is a poor way to commend one's self to the man who has dropped an important letter, perhaps, and hurried forward to wait upon a supposed customer.

The other day I was busy at my desk, which is quite a distance from our front door. A man came in whom, at first glance, I took to be a traveling man, and I kept on at work till he should reach my desk, desiring to save every minute that I could.

But instead of walking along toward me he stopped at the first showcase and began examining its contents as if in search of something, while he whistled and used a toothpick as if having no cares in this world. I began to wonder if I was right about him. Perhaps he was in search of something, and if so must look upon me as a very independent merchant not to go forward and wait upon him.

Finally, I could not see my duty clear to sit there longer, so I walked forward.

He did not advance toward me, but, on the contrary, began working back to the further end of the showcase, as if he had seen the article he wanted.

As I reached him he lifted his face from the glass to me for the first time, smiled in the universal way, and informed me that he represented the ——— Mfg. Company, and then gave me his card.

I was in no pleasant frame of mind, for there was nothing in our showcase in his line, over which he might have been interested, and no reason why he should not have walked back to my desk when he entered the store, instead of drawing me out to the front to meet him.

I bought no goods of him, nor would I have done so if I were wanting them ever so badly.

Back Orders.—One of the most provoking things, writes a correspondent, in having orders filled in part is that the one thing you want the most is sure to be the item placed on the back order.

I don't know how many times, but they are legion, I have discovered I was out of a certain article, and in making out an order added other goods that I was not then needing, but simply ordered to make up a package and divide freight charges. And then I have had these other goods sent along promptly, while the one item I really needed was not sent at all. I don't know how to remedy this, but it is terribly annoying.

Another thing about orders that annoys one, but which could easily be remedied: If I send an order to a jobber I get some goods at once and am given some advice about the goods placed on the back order book. But a great many factories have a very unsatisfactory way of acknowledging the receipt of one's orders, but never adding a word as to when the order will be filled.

This is a very great annoyance to a man who may be out of the goods and would like to know what he might promise to his own trade. At the office of the factory it is known about when the goods can be shipped, and a line to that effect upon the acknowledgment of the order would appear to be an easy thing to add and the natural thing, too.

Spot Cash.—"Men interpret things in various ways," writes a jobber. "I sold a bill of goods to a man for spot cash, giving him my best cash prices. The invoice read: 'Terms, Spot Cash.' The bill ran 60 days. I sent a statement, adding 60 days' interest, which he refused to pay, because in the printed heading of our bill was this line: 'Subject to draft at sight if not paid when due.' My customer said that he supposed I would draw for the amount of the bill and as I did not I was not entitled to interest!"

A Peculiar Decision.—"Speaking of printed terms reminds me," continues

the correspondent, "of a peculiar decision made by an Ohio judge a few years ago. The circumstances were these: A, in Cincinnati, sold B, in Toledo, a bill of goods. A printed line in the bill head read 'This bill is payable in Cincinnati or New York per funds.' B remitted for the invoice by a draft on New York, but before the draft was presented the Toledo bank issuing it had failed, and payment in New York was refused. A sued B for the amount of the invoice. It was admitted that due diligence had been observed in forwarding the draft and that B had nowhere been guilty of negligence, but it was claimed that the draft on New York was sent in compliance with the line in the bill head, that this draft was good when sent from Toledo and when received in Cincinnati and consequently that B had paid the bill, and the Toledo judge so decided. The case was never appealed.

Trade Items.

POPE MFG. COMPANY, 221 Columbus avenue, Boston, have issued their 1894 Columbia Calendar. It is composed of a block of calendar leaves, one for each day, fastened in a metal back. In addition to the date and blank space for memoranda on each sheet are remarks regarding the attractions and advantage of Bicycle riding.

THE ENTERPRISE MFG. COMPANY OF PENNSYLVANIA, Philadelphia, advise us that their stock of parts for Great American Meat Cutters is rapidly becoming exhausted, and that in future they can only supply such parts as they may have on hand at time of order, having decided not to continue the manufacture of the Great American Meat Cutters or the parts thereof.

THE BOSTON FILTER COMPANY, 21 Broadway, Chelsea, Mass., manufacturers of the Boston Water Purifier, sell their small Filters, but large ones, such as are used by hotels and restaurants, are put in at no original expense to the user, the company charging a nominal rent for the work of the Filter, and taking complete care of the apparatus. Although Boston has been noted as a great consumer of spring waters, the company advise us that they are successfully furnishing 90 per cent of the large hotels and restaurants in the city with their Filters.

AMERICAN ORMONDE CYCLE COMPANY have decided to consolidate their wholesale and retail trade at one address, and will move their retail business to 10 Barclay street, a few doors from Broadway, New York, on January 1.

A DECISION has just been rendered by Judge Putnam in the suit of Edmund Converse against Ambrose T. Matthews, both of Worcester, Mass., for the infringement of a patent relating to Stove Knobs having a base made from a blank with wings or leaves instead of from a circular piece of sheet metal, as Knob bases have heretofore been made. The decision of Judge Putnam sustains the patent, which is owned by the Worcester Ferrule & Mfg. Company, Worcester, Mass. We are advised that under this patent the cost of manufacturing Stove Knobs has been largely reduced.

OUR READERS will observe the advertisement among the Special Notices in this issue signed "Selling Agent," in which the advertiser announces his desire to represent manufacturers of leading goods to the wholesale trade of

the West and Northwest. The advertiser is a gentleman of long experience and wide acquaintance with the trade, and is in a position to render efficient service to those who may desire to make such an arrangement with him.

GRAHAM, HINKLEY & Co., exporters, 9 South William street, New York, are greeting their friends and patrons with an engraved card on heavy beveled board, extending the compliments of the season and wishing happiness and prosperity during the coming year. This well known house do an extensive trade with the West Indies and other South American countries.

F. W. WURSTER of F. W. Wurster & Co., who has accepted a place in Mayor-elect Schieren's cabinet as Fire Commissioner for Brooklyn, is well known there as the head of a large rolling mill plant at Kent avenue and South Sixth street. This is said to be the only mill of this character of any consequence in New York or Brooklyn rolling Merchant and Bar Iron. They also manufacture Axles largely. Mr. Wurster is president of the Hanover Club, a prominent social organization in the Eastern District.

THE HARDWARE AND STOVE STORE of Gates & Hillier, Cooperstown, Pa., was destroyed by fire on December 14. The loss is estimated at \$12,000. The firm will resume business as soon as possible, and advise us that they will be pleased to receive from manufacturers catalogues and price-lists relating to their goods.

JOHN G. ROLLINS, 15-25 Whitehall street, New York, issues a circular letter in which he calls attention to the fact that he has had 27 years' experience as a buyer from American manufacturers for export. He is a buyer from American manufacturers for shipment to Great Britain, Continental Europe, Australasia, India, China, Japan and South Africa. He lays emphasis on the fact that he can buy and ship on very favorable terms. Purchases are made exclusively for cash, thus enabling him to obtain advantages from producers. He adds that, employing no travelers, he can afford to work for small commissions, which he alludes to as a consideration in these days of acute competition. On application quotations will be made for anything manufactured in the United States, either delivered on ship or at nearest port of entry abroad.

THE ILLINOIS PURE ALUMINUM COMPANY, Lemont, Ill., are manufacturing an Aluminum Sanitary Pail. This article weighs 2½ pounds and is designed for use in hospitals, asylums and public institutions of any description. It is recommended for these uses because of its lightness, perfect cleanliness and freedom from odor, and because it is proof against corrosion.

Newhall Ship Chandlery Company.

NEWHALL SHIP CHANDLERY COMPANY, Henry B. Newhall Company, general agents, 105 Chambers street, New York, have adopted an original and novel method of calling the attention of their correspondents to prominent goods in their line. This is accomplished by illustrations of a different article on each letter head, under which is the catalogue page upon which the goods are found, together with a blank space for a quotation. A series of the letter heads illustrate Row Locks, Packing, Cleats,

Galvanized Blocks, Thimbles for manila and wire rope and repair links. The line of goods is thus prominently brought before their customers and particular emphasis called to the different lines by means of the quotation. A circular letter is being sent to the trade, in which the company refer especially to their Galvanized Malleable Iron Tackle Blocks, upon which a discount of 70 per cent. is quoted, delivered in New York, with 2 per cent. off for cash in ten days. A convenient catalogue devoted entirely to Awning Hardware, with blank pages for memorandum, has been issued by the company, which is particularly interesting because of its seasonableness.

Price-Lists, Circulars, &c.

M. A. WOODBURY, Bradford, Pa.: Woodbury's Automatic Dry Chain Lubricator. The part resting on the chain is a small sack 1 x 5½ inches in size, which is doubled over where it is held by a spring clamp, the long upper end of the clamp keeping the loose ends of the sack in place. The sack is filled with fine dry lubricant; the jar of the machine sifts the lubricant on to, and into the chain, while the sack dusts the wearing parts of the chain.

THE ALASKA REFRIGERATOR COMPANY, Muskegon, Mich.: Alaska Refrigerators. The 1894 catalogue of the company is well printed on a fine quality of paper, and handsomely illustrated. At the front of the book is a full page view of their works, showing buildings of large extent, in connection with which are their lumber yards. The buildings, which are of brick and stone, include a main factory, three stories high, 340 feet long by 60 feet wide; main warehouse, two stories high, 400 x 60 feet, and another warehouse 100 x 200 feet, besides several smaller buildings. Illustrations are given of soft and hard wood Refrigerators, Apartment House Refrigerators, Sideboards, Butchers', Grocers' and Florists' Refrigerators, Double Coolers, &c.

ONEIDA COMMUNITY, Niagara Falls, N. Y., and 59 Murray street, New York: Fine Silver Plated Ware. An illustrated catalogue shows Table Flat Ware in Christine, Viola and Windsor patterns, including Spoons, Forks, Sugar Spoons, Butter Knives, Sugar and Bon-bon Tongs, Fish Knives and Forks, Salt and Mustard Spoons, Ladles, Nut or Berry Spoons, Child's Sets, &c. The manufacturers refer to the quality and finish of their A1 goods, stamped with their name. They also make a complete line of medium grade Silver Plated Ware and solid unplated A1 Silver Metal goods, in both plain and figured patterns. A line of goods stamped N. F. Nickel Silver Company are warranted by the company to be made of 10 per cent. nickel silver, well plated and finished.

EASTERN FORGE COMPANY, 70 Kilby street, Boston, Mass., with works at Portland, Maine: Forgings of all descriptions; Machine, Blank and Tap Bolts; Hanger, Coach and Cap Screws; Boiler and Bridge Rivets, Special Bolts and Nuts, Railroad Track Bolts; Plain Cold Punched, Chamfered, Trimmed and Drilled, Hot Pressed and Hot Pressed Reamed Square and Hexagon Nuts. A well arranged and clearly printed catalogue gives list prices and tabulated information about the foregoing goods in convenient form. Tables are also given of the weight per 100 of Machine Bolts, Blank Bolts and Coach Screws; number of Railroad Spikes to 100 pounds and the weight per lineal foot of round, square and flat Iron.

BROCKTON MALLET & MACHINE COMPANY, Brockton, Mass.: Mallets, Maule, Hammers, Handles, &c. The Mallets are made of imported rawhide disks, secured between two collars on a solid steel hub, with a leather handle made of selected leather disks compressed on a solid steel rod, then turned down to fit the hand, thereby producing, it is claimed, a handle that will not bend, break, work loose or blister the hand, as it is porous and absorbs the moisture. It is stated that the Mallets are subjected to a pressure of 30 to 50 tons.

It Is Reported—

That Geo. W. Redman's Hardware and Furniture store at Green's Landing, Maine, was considerably damaged by fire on the 9th inst. The damage to the building was \$300 and to the goods \$500. The former was insured, but there is no insurance on the latter.

That the Stewart & Sox Hardware Company, Albany, Ore., have been incorporated. The capital stock is \$35,000, divided into 350 shares. About January 1 the company will move into their new quarters. The members of the company are E. F. Sox, C. H. Stewart and E. Redeker.

That the Tompkins Hardware Company and the Cary Hardware Company of Leadville, Col., have consolidated their interests, and will hereafter conduct business as one establishment. The capital stock of the new company has been placed at \$100,000. The officers are as follows: H. H. Tompkins, president; John Harvey, vice-president; D. La Salle, treasurer; I. J. Cary, manager. The directors are H. H. Tompkins, John Harvey, L. H. Tompkins, D. La Salle and I. J. Cary.

That W. C. Grier has sold his Hardware store at Blunt, S. D., to N. E. Westover. Mr. Grier has removed to Plymouth, Wis., where he has purchased a Hardware stock and will continue the business.

That A. F. Anderson has purchased the Hardware business of H. L. Rich at Red Wing, Minn.

That M. A. Simpson has bought the stock of Hardware of H. Fishman, Mt. Airy, Ill.

That J. H. Barlow and Chas. Turk of Woodward, Iowa, have bought the Hardware stock of E. M. Jones. They will hereafter conduct the business under the style of Barlow & Turk.

That Chas. B. Payne of Knox County has purchased the stock of Hardware of W. B. Keller, Brashear, Mo.

That the second and third stories of the building of the Fones Hardware Company, Little Rock, Ark., were burned out on the 20th inst. The loss, which was heavy, is fully covered by insurance.

That Harrington & Knight, Hardware dealers, who were burned out in the great fire at Fargo, N. D., some months since, have taken possession of their new quarters.

That a new Hardware and Tinware store will soon be opened at Wayne, Mich., by Drew & Doolittle.

That Mitchell's Hardware store at Packwood, Iowa, was destroyed by fire on the 21st inst.

That E. N. Falke, formerly of Massillon, Ohio, has opened up a Hardware store at 811 Monroe street, Toledo.

That J. W. Smith and P. J. Alexander have bought the Hardware store of J. S. Smith & Son, Farber, Mo.

That Emerson & Fehlman, Steele City, Neb., have bought out the Hardware stock of F. Maw.

That J. P. Siner's Hardware store, at Shelburn, Ind., was destroyed by fire on the 19th inst.

That G. H. Cure, Pipestone, Minn., has sold his stock of Hardware to H. A. Marsh of Mason City, Iowa. Mr. Cure will continue with Mr. Marsh for the present.

That the Hardware store of Sires & Tulley, Trenton, Mo., was robbed on the 18th inst.

That W. S. Cox and R. A. Brownlee of Havelock, Iowa, will open a new stock of Hardware at Mallard in the near future.

That W. M. Rogers, late of Kittleton, Col., has opened a Hardware store at Florence, Col. He will also conduct a plumbing and tin shop.

That the stock of Hardware of E. P. Messer & Co., Sheldon, Iowa, was destroyed by fire on the 11th inst.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Nothing has occurred to relieve the uncertainty that has existed for some time past in the general market for Paints and Colors. The outlook for the leading pigment, White Lead, is quite as puzzling as it has been at any time during the past 60 days. While superficially firm, the market for Linseed Oil is a very uncertain one. This tends to restrict trade, and there is just enough uncertainty about the future of other base materials, along with general trade inaction, to keep business down to smaller volume than usual at this season of the year. There is nothing suggestive of speculative tendency in any direction. Most accounts go to show that retailers are buying in an extremely conservative way and that manufacturers are governing their operations accordingly.

White Lead.—Except for small quantities there is no demand at present. Jobbers talk and act as though they were perfectly satisfied to follow conservative policy of the most pronounced type until some of the uncertainties as to action by the leading producers are at least partially cleared up. Meanwhile the "outside" manufacturers continue a vigorous competition and list prices for trust brands are nominal in a great degree. Quick process and mixed Leads are selling at prices quite as low as any that have ruled previously this year, and small lots of "combine" Lead are still being dealt out by jobbers at less than the official list rates.

Red Lead and Litharge.—Fair orders have been placed for foreign brands, chiefly low grade, for future delivery. Otherwise dealings continue to be small and the demand generally is spiritless. Prices are rather weak, but show no radical change.

Orange Mineral.—While no radical change in prices of foreign brands is quoted, the fact is admitted that the market continues to be rather weak and the probabilities are that buyers of round lots can secure concessions of about $\frac{1}{4}\%$ @ $\frac{1}{2}\%$ from popular quotations. American is very quiet also, but quoted at old prices.

Zincs.—There has been no change in the market for American Oxide. The general report is that orders have averaged small, but that the business effected was chiefly at prices in line with quotations that have been general for some time past. The surface indications are that the market is in rather weak condition, due chiefly to slowness of orders. The list prices for foreign brands remain unchanged, but these are shaded more or less by some jobbers.

Colors, &c.—Somewhat more liberal orders have been placed for bulk stock used by grinders, at, as far as could be learned, very low prices; apart from this nothing but routine winter season business appears to have been effected in either Dry or Oil Colors and the general report was that the demand continues slow. Ready mixed Paints are being ordered for future delivery to a fair extent, but spot business continues slow.

Oils and Turpentine.

The past week has been as bare as the preceding one was in point of distinctively new feature. Hardly anything outside of routine business has been effected and nothing has occurred that would tend to stimulate purchases for either home trade or foreign account. Prices, with a very few exceptions, have remained almost stationary, and it is only in remote instances that the dullness in general trade, or the extreme caution that usually prevails at this season of the year, has been broken. There is nothing in the present situation of affairs indicative of any radical change in the immediate future.

Linseed Oil.—No further changes in prices have been made by either local or outside crushers. The basis price of 47¢ for raw Oil prevails and competition is conspicuous in its tameness. To some extent this may be attributed to the condition of the market for raw material, but there are some signs that late conflicting interests are working quite harmoniously for the time being.

Cotton Seed Oil.—Prices have undergone hardly any change, and the general situation of the market remains about the same as it was last week. Home trade buying has been commonplace and export business tame, while the former line of prices has ruled for both crude and refined products.

Lard Oil.—Prices have ruled somewhat lower and the market is at present in rather uncertain form, but showing signs of weakness. On prime stock 70¢ has been a common price and business was done at as low as 69¢, but, in view of the condition of the market for raw material, pressers are very slow to take further orders at those figures. Low grades have been sold to a moderate extent at about 1¢ @ 2¢ under the popular quotations.

Fish Oils.—Comparatively little business has been effected in crude Sperm, Whale or Menhaden Oils, but the deals put through were chiefly at old prices and nothing has transpired that would point to probable radical changes in the immediate future. The movement in pressed and bleached Oils has been strictly routine and at practically former prices.

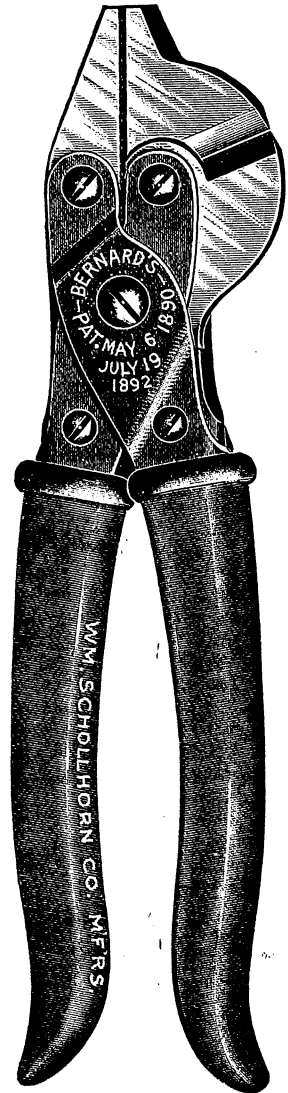
Miscellaneous.—Olive Oil has moved out in moderate quantities at former prices. The same may be said of Coconut. Red Oils have just about held their own in price, although rather dull. Mineral Oils are without radical change in price and find rather slow sale.

Spirits Turpentine.—Prices have been remarkably steady, varying in a frac-

tional way only from 29¢ to 29½¢. Business has continued spiritless, but enough stock goes out to prevent any great accumulation here. Shipments from primary points are only fair, and most advices note a favorable position.

Lineman's Plier.

William Schollhorn Company, New Haven Conn., Julius Berbecker & Co., agents, 65 Duane street, New York have incorporated the Bernard principle in cutting pliers in a tool designed for linemen, as here illustrated. It is in-



Insulated Lineman's Plier.

tended for cutting high tension electric wires with no risk to the operator. It is 8 inches long, of crucible steel, polished and nicked. The interchangeable parts are held together with screws and hexagon nuts, so that, if necessary, any portion of it can be renewed at will. Directly under the center pinion, opposite the cutter, is a set screw, to compensate for any wear on the cutter. The cutting jaws have a maximum opening of $\frac{1}{2}$ inch, diminishing to $\frac{1}{8}$ inch at the base. Single copper wires of a diameter of $\frac{1}{4}$ inch, together with the usual covering, are easily cut. The handles are covered with pure, soft, black rubber to protect the user from shock, while the coverings can be removed or replaced at any time. Later a smaller size, 5 inches long, will be brought out for the same purpose.

The Breck Sap Spout and Cover.

Joseph Breck & Sons, Boston, Mass., are placing on the market the sap spout and cover herewith shown. The spout, Fig. 1, is of galvanized malleable

inserted in the spout hole, as the only bearing of the spout in the tree is the point at the back of the hole and the reduced body portion in the bark. The manufacturers remark that the sap lies within an inch of the bark, and that upon this principle the spout is made.

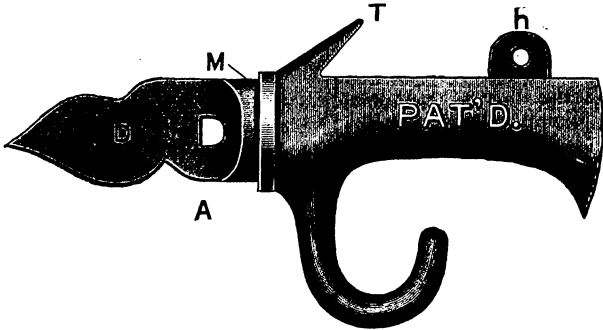


Fig. 1.—The Breck Sap Spout.

iron, to make it indestructible, and is inserted in the $\frac{1}{4}$ -inch hole V, as in Fig. 2, bored 1 inch into the tree. The point of the blade D is driven slightly

In Fig. 3 the cover is represented by H, and consists of a thin metallic sheet, provided with holes for receiving the spout eyes h. The edge of the cover is inserted under the undercut shoulder T on the spout, the eyes h projecting through the opening in the cover. The

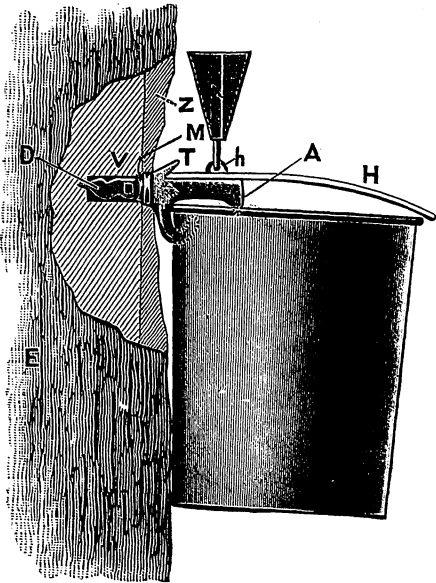


Fig. 2.—Sap Spout, Indicator, Bucket and Cover.

into the body of the tree at the back of the hole V. The reduced portion M, of the spout body enters that portion

cover is designed to prevent rain, snow, sun and falling particles from entering the bucket and discoloring the sap collected. As the cover is attached directly to the spout, it interferes in no way with removing the bucket. It is stated that all sap spouts will freeze during a cold snap, but that the reflection of the sun on the tin cover will produce heat enough to thaw the spout from one to two hours earlier than others. In connection with the cover, in Fig. 3, is the pin No. 15 for attaching the cover to the spout, and carrying an indicator, X; this is designed to show, as far as it can be seen, that the bucket has been emptied, or

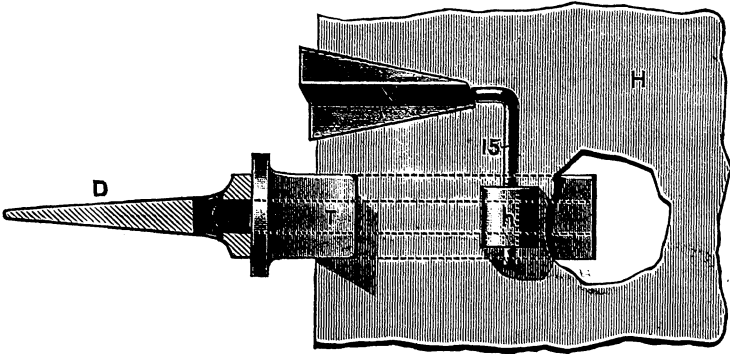


Fig. 3.—Cover and Indicator.

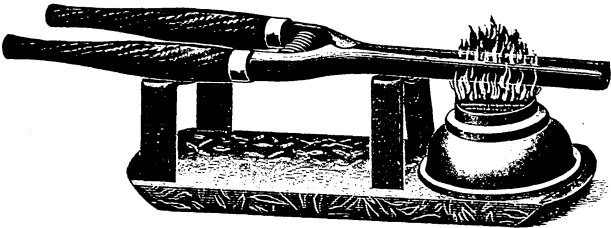
of the hole V surrounded by the bark Z of the tree and forms a bearing for the spout. It is explained that by this means the grain of the wood is in no manner compressed by the spout when

vice versa. As each bucket is emptied and replaced on the hook, the indicator is to be turned up to show that the tree has been visited. At the next gathering the indicators are turned down.

The point is made that often the same tree is visited two or three times unnecessarily after the sap has been gathered, and that the indicators prevent this loss of time; also that all the trees must be attended to, as any omission will be shown by the position of the indicator. The spouts and covers can be obtained separately if desired, also special bits by which all holes will be bored the exact depth. The manufacturers call attention to the fact that their spouts will not break in driving, and that the buckets will not twist the hooks off under the strain of high winds.

Princess Curling Iron Heater.

Thos. W. Houchin, 67-69 Park place, New York, has just brought out the Princess No. 1212 alcohol curling iron heater as here shown. It is similar in principle to one already marketed by him. The Princess is offered at much less cost, although affording practically the same results. The base is of decorated tin $5\frac{1}{2} \times 2\frac{1}{4}$ inches in size. At one end is a brass lamp with removable cap. The lamp is packed with asbestos and covered with wire gauze. It requires no trimming and is always ready for use when saturated with alcohol.

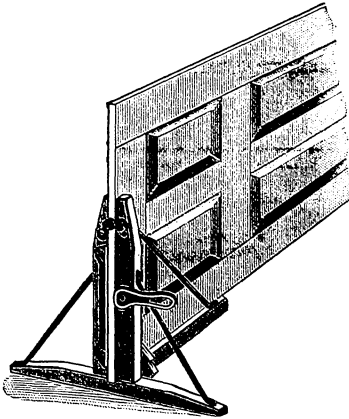


Non-Explosive Curling Iron Heater.

Occupying but little space, it is especially convenient in traveling. The heaters are neatly packed one each in a pasteboard box open at the ends.

Immel Door Clamp or Vise.

The Buckeye Mfg. Company, Union City, Ind., are offering the clamp or vise illustrated herewith. The device is



Immel Door Clamp or Vise.

arranged to hold the door when planing the top or bottom as well as the sides. The clamp is designed to be carried from doorway to doorway, and may also be used for holding window sash when fitting them. It is explained that the instant the clamp is dropped on the floor it is ready for use, being held in place by its weight, resting on three sharp points protruding from it into

the floor. It may be folded up so as to take but little space in a tool box. Samples will be furnished by the company to any responsible dealer to be sold on three days' trial, and if not satisfactory it may be returned, and money will be refunded.

The Hallenbeck Hammerless Gun.

Syracuse Arms Company, Syracuse, N. Y., are introducing the hammerless gun, illustrations of which are herewith given. The lock, as shown in Fig.

whether the barrels are on or off of the frame. The whole gun can be taken apart and assembled without the use of other tools than a screw driver. The manufacturers state that their cheapest gun will have as close workmanship as the highest price guns, and that they will aim to do the finest of work both in fitting and finishing.

Cloyd's Flooring Clamp.

The accompanying illustration represents a flooring clamp offered by the

in getting siding or flooring in place for nailing.

Columbian Folding Curling Iron.

The cut herewith given illustrates both the form of the new Columbian

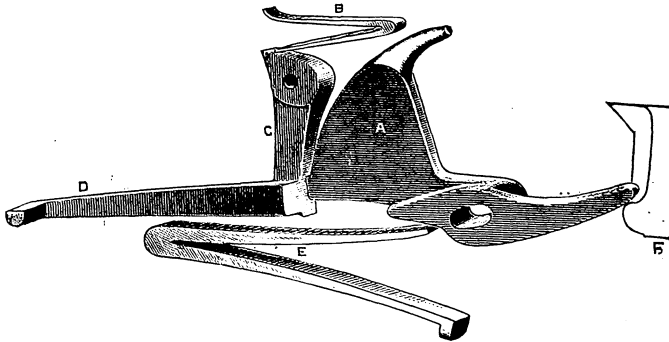
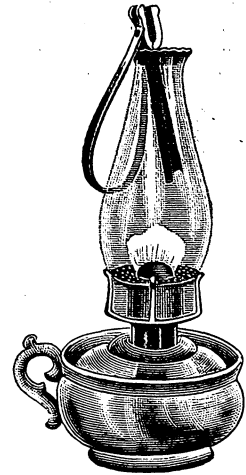


Fig. 1.—All Parts of Lock and Locking Device.

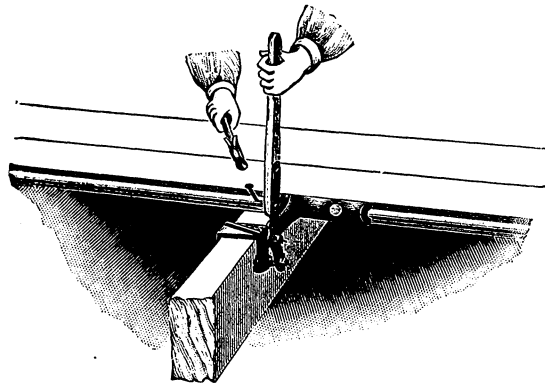
1 is simple, being composed of but four pieces without any screws, and yet so firmly fitted, it is remarked, that one in constant use for the past year shows no signs of looseness. As shown in Fig. 2, the cocking arm, hammer and firing pin are all one piece, and the cocking arm or hammer has a bearing directly on the lug, with no intermediate pieces, making, it is stated, a remarkably easy cocking device. The cocking and firing mechanism is all contained in the metal frame, thus avoiding the cutting away and consequent weakening of the stock, and allows a large wood surface bearing on the frame. It is pointed out that the safety mechanism is simple and positive and that it is impossible to insert a shell in the gun until the hammers are at full cock. Another feature is the positive action of the cocking device, the lug hooking directly on the hammer without any intermediate or auxiliary pieces. It is explained that the main spring forces a connection between the hammer and the lug through the agency of a slot in the hammer, which device, it

Buckeye Mfg. Company, Union City, Ind. The clamp, it is stated, can be

folding curling iron and the manner in which it can be placed for heating



Columbian Folding Curling Iron.



Cloyd's Flooring Clamp.

worked with one hand while using the hammer with the other. The point is over the flame of a kerosene lamp. There are no wood handles to get loose

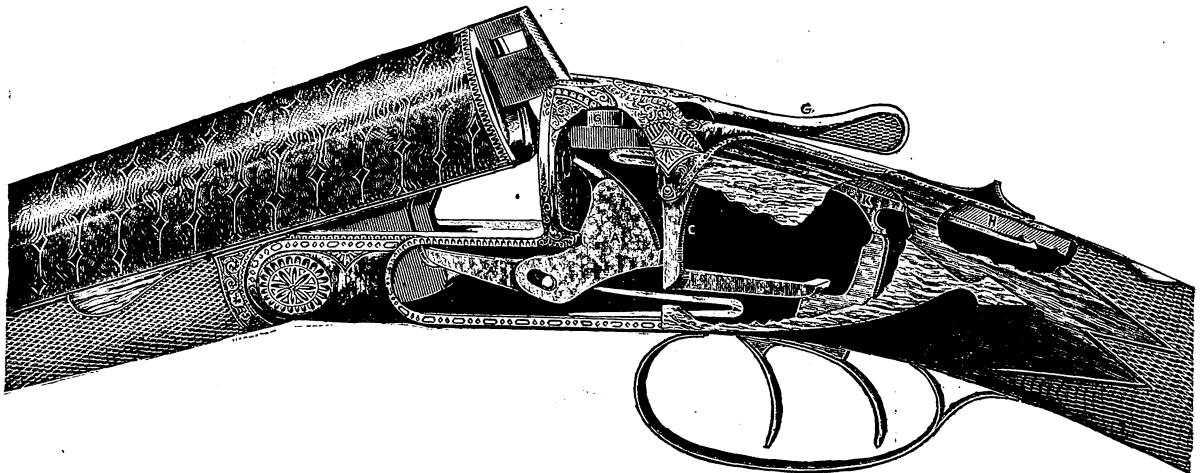


Fig. 2.—Lock and Cocking Device in Position.

is claimed, is peculiar to only this gun. The barrels can be hooked on or taken off with the hammers in any position by removing the fore-end and the fore-end fastener holds it to the barrels

made that the clamp will be found particularly useful when laying crooked and warped flooring, or in putting on crooked siding, and that with its use no chisel need be used or time wasted

or burn off. As it folds into small space it is easy to carry. It is manufactured by the American Curling Iron Works, 72 to 74 Market street, Chicago.

Cable Adjustable Handle Bar.

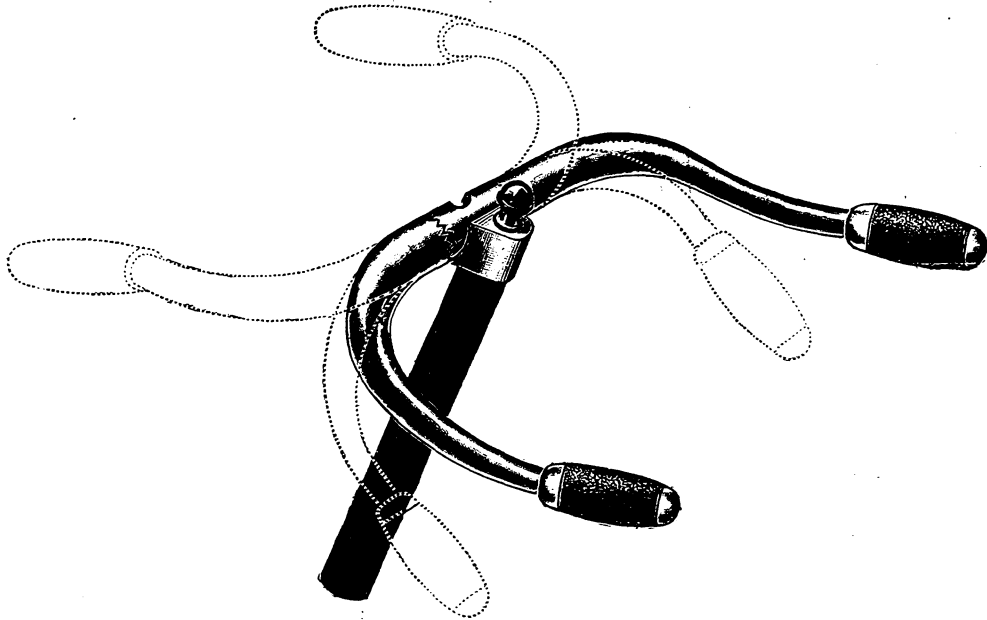
The accompanying illustration is of the cable adjustable handle bar, controlled by the Yost Mfg. Company, Yost's Station, Toledo, Ohio. It is stated that the construction of the bar is such that its strength is fully equal to the solid bar, and that either end of the bar can be thrown up or down to any angle desired by the rider without

fancy without the annoyance of an objectionable increase in weight or the necessity of having a special bar made for him. The company expect to fit the adjustable handle bar for any make of machine.

The Darling Filters.

Darling Filter Company, 26½ South Water street, Cleveland, Ohio, are of-

other valve is for supplying the water to be filtered. The point is made that through the glass casing the dirt can be seen accumulating on the porous tube and also disappear in cleaning. The filter has been tested in Cleveland, St. Louis, Kansas City and at other points. The report of an analytical chemist at Kansas City states that a chemical analysis and microscopical examination showed that all suspended matter, as well as a portion of the or-



Cable Adjustable Handle Bar.

the aid of a wrench. The dotted lines in the cut give a clear idea of the changes that can be made in the position of the grips, which may be given either an upward or a downward turn. The bar can be swung around in the fork upright and thus has a 2-inch ad-

fering the filters represented in the accompanying cuts. The Self Cleaning filter, shown in Fig. 1, has a glass casing, which is used where the water pressure is not over 75 pounds to the square inch; where more than that a nickel casing is used. The manufact-

ganic matter, had been removed and that the water was free from microbes existing in the unfiltered water. The manufacturers claim that the filter is absolutely germ proof, that it will filter from 10 to 15 gallons of water per hour, and that it is cleaned in three minutes,

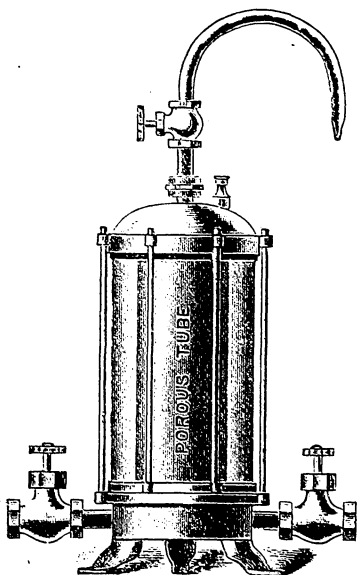


Fig. 1.—Darling Self Cleaning Filter.

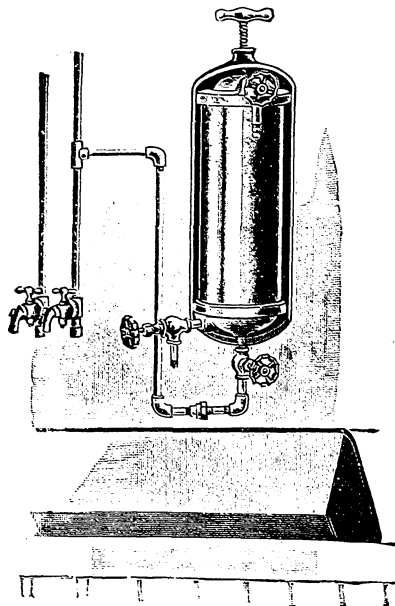


Fig. 2.—Little Darling Filter.

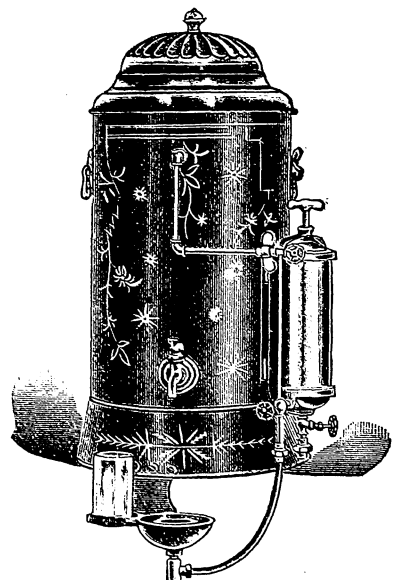


Fig. 3.—Little Darling Filter and Water Cooler.

justment to or from the saddle. When this is done and the proper distance of the grips from the saddle is secured, the ends of the bar can be exchanged or reversed, so as to get either the up turned or down turned grip, as may be wanted. The design of the bar is to solve the problem of how to secure any style of handle bar a rider may

urers state that the filter never has to be taken apart to be cleaned and that a feature peculiar to this filter is the forcing of the cleaner against the porous tube, so that by revolving the goose neck at the top of the filter a few times the tube is cleaned. One of the valves at the bottom of the filter is for carrying off the accumulated dirt and the

without shutting off the water or taking out the tubes. Fig. 2 shows the Little Darling filter, which is taken apart for cleaning. This is done by simply unscrewing the screw at the top of the filter, lifting the nickel casing out and brushing off the porous tube. The Little Darling is shown in Fig. 3 attached to a water cooler. The cooler

is provided with two reservoirs, one for ice and the other to hold 3 gallons of filtered water. It also has an automatic valve for closing the filter when the reservoir is full. This arrangement is designed for use where a large quantity of filtered water is required.

Hayes' Safety Kettle Bottom.

The safety kettle bottom shown herewith is offered by the Diamond Hardware Company, 620 Atlantic avenue, Boston, Mass. It is made of steel, so as to give it requisite strength, and is principally designed to be placed inside a kettle, to prevent meat, vegetables and other articles of food sticking or burning on the kettle bottom while being boiled. It is explained that the bottom may be put to many other uses, as



Hayes' Safety Kettle Bottom.

follows: Turning it bottom side up in the kettle, it makes a good and convenient steamer; it may be used bottom side up on the top of the stove to keep hot tea, coffee or anything that it is not desirable to place on the bare stove; it may be placed in the same position on the table for a sad iron holder; if pies are not sufficiently baked on the bottom

The Yost Tire.

The tires and rims which the Yost Mfg. Company, Yost's Station, Toledo, Ohio, will fit on their gentlemen's wheel are illustrated in the cuts herewith given. The tire is of the inner tube

are its simplicity, ease of repair and resiliency. It is stated that it is very sensitive on the road and will not roll, as the rims and wires bind the cover into place at the extreme outer edges of the rim, thus preventing its pulling away from the rim or rolling. The company

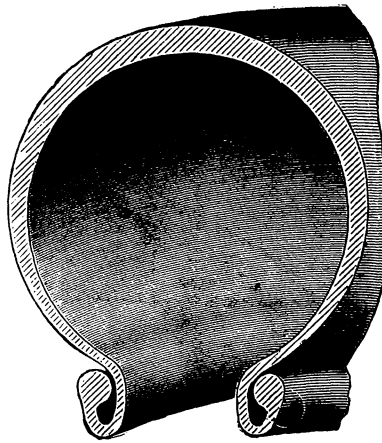


Fig. 1.—The Yost Tire.

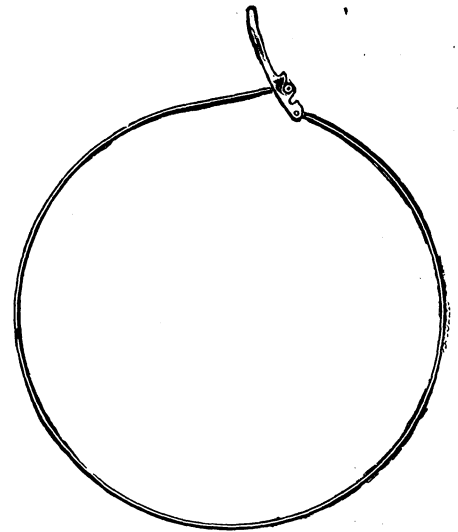


Fig. 2.—The Fastening Wire.

pattern, and the outer cover, as shown in Fig. 1, has beaded edges to hold the wires which fasten it to the rim, one on each side. One of the wires is shown in Fig. 2. It is explained that the rim is so designed that it forms a grip for the outer cover, partially supporting it and relieving the wires of much of the strain. The wires are so arranged that they can be locked at any point on the tire, and the lever by which each wire

will fit these tires and rims to any make of wheel desired.

The Mason Regulator Company of Boston have made three additions to their engineering series. No. 4, "Electricity for Engineers," contains such facts about electrical machinery as every engineer who has it under his charge needs to know; also all the rules of the Underwriters' Union for the installation

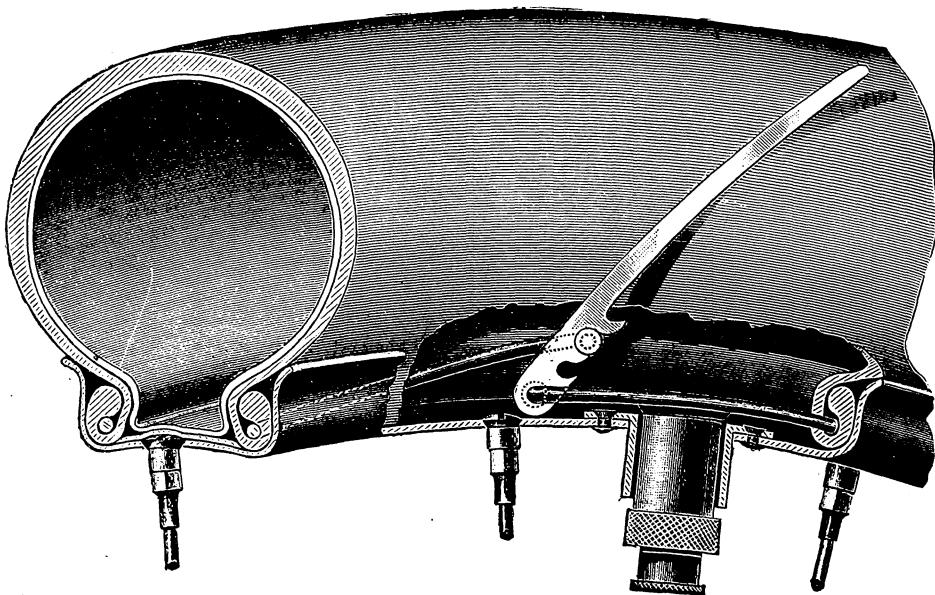


Fig. 3.—The Yost Tire and Rim.

the baking may be completed by putting them in the kettle bottom on the top of the stove; it may be used for broiling meat or toasting bread by removing a stove lid and setting the bottom in the kettle hole, and in the same position a tea or coffee pot may be set in it to boil quickly.

is drawn up to the proper tension and locked has three points of adjustment, as in Fig. 3. It is stated that in case of a puncture the wire can be removed from either side and the inner tube taken out, patched and replaced very quickly and the rim adjusted to place almost instantly. The merits claimed for the tire

of electric plants; 50 cents, post paid: No. 7, the "Engineers' Log Book," for keeping an accurate and systematic record of the engine room; 50 cents. No. 8, the "Chief Engineers' Record Book," for keeping the record of the mechanical plants of large factories; 75 cents.

Current Hardware Prices.

DECEMBER 27, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....\$ doz \$3.00, 33%@33%&10%
Excelsior.....\$ doz \$10.00.....50&10&5%
North's.....\$ doz \$10.00.....50&10&5%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—
Eagle Anvil, 4 lb. 9c.....15@15&5%
Horse shoe brand, Wrought.....11@11%
Moore & Barnes Mfg. Co.....33%
Imported—
Armstrong Mouse Hole.....10%@11%
S. & H., machine finished.....10%@11%
Trenton.....10%@11%
Wilkinson's.....10%@11%
Peter Wright's.....11@11%
Anvil Vise and Drill—
Allen Anvil and Vise \$3.00.....40&10%
Cheney Anvil and Vise.....25%
Millers Falls Co., \$18.00.....20%
Star.....45&5%

Apple Parers—See Parers

Apple, &c.
Augers and Bits—
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Common Augers and Bits.....70@70&10%
Cincinnati Bell-Hangers' Bits.....30&10%
Forsner Pat. Auger Bits.....15%
Jennings' Pattern Auger Bits.....40%
Jennings' Pattern Auger Bits.....50%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, set 32% quarters, No. 5, \$5; No. 30, \$3.50, 25%
Russell Jennings' Augers and Bits 25&10%
Lewis' Patent Single twist.....45%
L'Hommedieu Car Bits.....15&10%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
Snell's Bits.....60&5%

Bit Stock Drills—

Cleveland.....50&10&5%
Cincinnati.....30&10%
Cincinnati, for metal.....45&10%
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list), 30&30&5%
Expansive Bits—
Clark's small, \$18; large, \$26.35@35&10%
Ives' No. 4, \$ doz \$60.....20%
Steer's, No. 1, \$26; No. 2, \$18.....35&40%
Stearns' No. 2, \$48.....20%
Swan's.....40%
Gimlet Bits—
Bee.....25@25&5%
Common.....\$ gross \$2.75@3.25
Diamond.....\$ doz \$1.25.....40&10%
Double Cut.....45@45&10%
Shepardson's.....45@45&10%
St. Valley Mfg. Co.....45@45&10%
Hartwell's.....\$ gro. \$10.00.....40&10%
Douglass.....40&10%
Ives.....60&10&5%
Hollow Augers—
Bonney's Adjustable, \$ doz \$48.....50%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%
Douglass.....33%@33%&10%
French, Swift & Co. (Beecher).....33%@33%&10%
Ives' Expansive, each \$4.50.....50&5%
Stearns'.....20&10%
Universal Expansive, each \$4.50.....20%
Wood's.....25@25&10%
Ship Augers and Bits—
L'Hommedieu's.....15&10&15&10&5%
Snell's.....25@25&10%
Snell's Ship Auger Pattern Bits.....15&10&15&10&5%
Watrous'.....25@25&10%
Awl Hafts—See Hafts, Awl.

Awls—

Awls, Sewing, Common.....\$ gr. 85¢@90¢
Awls, Should, Peg.....\$ gr. \$1.50@1.55
Awls, Pat. Peg.....\$ gr. 35¢@38¢
Awls, Shouldered Brad.....\$ gr. \$1.30@1.40
Awls, Handled Brad.....\$ gr. \$2.50@3.00
Awls, Handled Scratch.....\$ gr. \$4.00@4.50
Awls, Socket Scratch.....\$ doz. \$1.10@1.20
Awl and Tool Sets—See
ets, Awl and Tool.

Axes—

First quality, best brands, \$7.00 Plain. Beveled. \$7.50
First qual., other brands 6.50 7.00
Second quality.....5.50 6.00
Axle Grease—See Grease.
Axle.
Axes—
No. 1.....34¢@4¢; 4¢@5¢
Nos. 7 to 14.....70¢
Nos. 15 to 28.....47¢
Nos. 19 to 22.....70¢
Concord Axes, loose collar.....44¢ 3¢ cash
Concord Axes, solid collar.....50¢ 6¢

Bag Holders—See Holders, Bag.

Balances—
Spring Balances.....20 30 40%
No. 200.....0.80 0.95 1.75 net
Chatillon, \$ doz.....40%
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire—See Wire, Barb.

Bars—
Cast Steel.....\$ doz 3 3/4
Iron, Steel Points.....\$ doz 3 3/4
Crow—
Cast Steel.....\$ doz 3 3/4
Iron, Steel Points.....\$ doz 3 3/4

Basins, Wash—
Standard Fiberglass, No. 1, 10 1/4 in., \$1.80;
12-inch, \$2.00; 13 1/4-inch, \$2.50; 15-inch,
\$3.00.

Beams, Scale—
Scale Beams, List Jan. 12, '82.....50&10%
Chatillon's No. 1.....40%
Chatillon's No. 2.....40%
Custer's.....33%
Beaters—
Egg—
Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Beaters—Egg—

Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Beaters—Egg—

Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Beaters—Egg—

Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Beaters—Egg—

Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Beaters—Egg—

Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Beaters—Egg—

Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Beaters—Egg—

Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gro., No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00@1.20
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.50
Silver & Co.....\$ gro \$5.50
Spiral.....\$ gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Culinary—
Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%
Bells—
Cow—
Common Wrought.....60&10%
Dodge, Genuine Kentucky.....70@70&10%
Kentucky Durham.....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Texas Star.....50&10&50&10&5%
Western, Sargent's list.....70&10%

Boils—

Carriage, Machine, &c.—
Com. list June 10, '84.....80&10%
Genuine Eagle, Norway, list Oct. '84.....80&10%
Eagle, Norway, list Oct. '84.....80&10%
Phila. pattern, list Oct. 7, '84.....80%
R.B. & W., old list.....70%
Bolt Ends, list Jan. 1, 1890.....80&10%
Machine, list Jan. 1, 1890.....80&10%
Door and Shutter—
Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Chain (Sargent's list).....65&10%
Cast Iron Shutter Bolts.....70&10%
Ives Patent Door Bolts.....60&10%
Wrought Barrel.....70&10%
Wrt B. K. Flush, Common.....55&10%
Wrt Shutter, Brass Knob.....50&50&5%
Wrt Shutter, Sargent's list.....60&10%
Wrt Shutter, all Iron, Stanley's.....60&10%
Wrought Square.....70&10%
Wrt Sunk Flush, Sargent's list.....60&10%
Wrt Sunk Flush, Stanley's list.....60&10%
Stove and Plow—
Plow.....60&10%
Stove.....60&10%
R. B. & W., Plow.....55%
Tire—
Common, list Feb. 28, '83.....65@65&5%
American Screw Company.....75%
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Phila., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
Port Chester Belt and Nut Company.....65%
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
R. B. & W., Philadel., list Oct. 16, '84.....80%
Borers, Tap—
Common and Ring.....20&10%
Clark's.....33%
Enterprise Mfg. Co.....20%
Ives' Tap Borers.....33%
Box—
Per B.....9%
Boring Machines—See Ma-
chines, Boring.
Bow Pins—See Pins, Bow.
Boxes, Wagon—
Per B.....2%
Boxes, Miter.
Spilker's Excelsior, 3 in. \$7.50, 4 in.
\$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%
Braces—
American Bit Brace and Tool Co.
Nos. 10, 12, 20.....60&10%
Nos. 24, 30, 36, 42.....70&10%
Nos. 22, 28, 32, 38.....60&10%
Nos. 13, 26, 38, 37.....70&10%
Amidon's
Barker's Imp'd Plain.....75&10%
Barker's Imp. Nickle.....65&10%
Ratchet.....75&10%
Eclipse Ratchet.....60%
Globe Jawed.....40&40%
Corner Brace.....40&40%
Universal, 8 in., \$2.10; 10 in., \$2.25
Buffalo Ball.....\$1.10@1.15
Barber's.....60&10%
Bartholomew's
Nos. 117, 118, 119.....50&10%
Common Ball, American.....\$1.00@1.10
Davis Patent.....60&10%
Fray's Genuine Spofford's.....50&50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414
60&10%
Ives' New Haven Novelty.....70&70&5%
New Haven Ratchet.....60&50&10%
Barber Ratchet.....60&50&10%
Barber's.....60&5%
Spofford.....60&50&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Saxton's
Barker's Imp. Polished.....75&10%
Barker's Imp. Nickle.....65&10%
Ratchet, Polished.....60&10%
Ratchet, Nickle.....40&10%
Buffalo Ball.....net, \$1.10@1.15
Brackets—
Shelf, fancy.....70@70&10%
Sargent's list.....60&10%
Other makes at a wide range of prices.
Shelf, plain.....65@70%
Sargent's list.....60&10%
Bradley Shelf Brackets.....70&10%
Bright Wire Goods—See
Wire.
Broilers—
Hen's Self-Inch.....9 10 9x11
Basting, 1 per doz.....\$4.50 5.00 6.50
Morgan Odorless.....\$ doz \$12, 60%
New Haven.....60%
Queen City.....33%
Wire Goods Co.....65&10%
Buckets, Well—
Galvanized—
Helwig's Flat Iron Band.....\$3.75
Helwig's Wired Top.....\$ doz \$4.00
Hill's.....\$ doz 12 qt. \$4.25; 14 qt. \$5.25
Iron Clad.....\$ doz 14 qt. \$4.25@4.50
Bull Rings—See Rings, Bull.
Butcher's Cleavers—See
Cleavers, Butchers.
Butts—
Brass—
Cast Brass, Fast.....33%
Cast Brass, Loose Joint.....33%
Cast Brass, Tiebout's.....50%
Wrought Brass.....80%
Cast Iron—
Fast Joint, Broad.....50&10%
Fast Joint, Narrow.....50&10%
Loose Joint, Japanned.....75&5%
Loose Joint, Jap. with Acorns.....75&10%
Loose Pin, Acorns.....75&10%
Loose Pin, Acorns, Japanned, &c.
Plated Tips.....50&10%
Loose Pin, Acorns, Japanned, &c.
Mayer's Hinges.....50&10%
Parliament Butts.....50&10%
Wrought Steel—
Fast Joint, Broad.....50&10%
Fast Joint, Narrow.....50&10%
Fast Joint, Lt. Narrow.....50&10%
Inside Blind, Light.....50&10%
Inside Blind, Regular.....50&10%
Loose Joint, Broad.....50&10%
Loose Pin.....50&10%
Table Butts, Back Flaps, &c.....50&10%
Brazed Wrought Butts.....50&10%
Cages, Bird—
Hendryx, Brass or Enameled.....50&10%
Hendryx, Wood.....40&10%
Callipers—See Compasses.
Calks Toe—
Burke's, One Prong, Blunt.....54%
Burke's, One Prong, Sharp.....54%
Burke's, Two Prong, Blunt.....54%
Gautier, One Prong, Blunt.....54%
Can Openers—See Openers,
Can.
Cans, Milk—
S. & Co., 5-gal., \$3.00; 8-gal., \$4.40;
10-gal., \$4.75 each.....40&10%
Cans, Oil—
Galvanized Blue Band, 1 gal., \$ doz \$2.25
Galvanized Blue Band, 5 gal., Tip Top
Galvanized Blue Band, 5 gal., Faucet,
\$ doz, \$3.00
Glass Oil, Friend.....\$ doz \$2.75
Caps—
Percussion—
Hicks & Goldmark's and Union Metallic
Cartridge Co. \$1000
Eley's E. B. \$500
Eley's D. Waterproof, Central.....\$1.00
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50%
E. B. Trimmed Edge, 1-10's.....47@50%
F. L. Waterproof, 1-10's.....35@37%
G. D.....27@30%
Musket, Waterproof, 1-10's.....50&5%
S. B. Genuine Imported.....45%
Primers—
Berdan Primers, \$1.00.....2%
B. L. Caps (Sturtevant Shells) \$1.00.....2%
All other Primers, \$1.20.....2%
Cards—
Watson's Cotton, Wool, Horse and
File, list January 28, 1891.....25%
Carpet Stretchers—
See Stretchers, Carpet.
Cartridges—
B. B. Caps, Cent. Ball, Swgd., \$2.00.....2%
B. B. Caps, Round Ball, \$1.75.....2%
Blank Cartridges, except 22 and 32 cal.,
additional 10% to above discounts.
Blank Cartridges, 22 cal., \$1.75.....2%
Blank Cartridges, 32 cal., \$3.60.....2%
Cent. Fire, Military and Sporting.....15&5%
Cent. Fire, Pistol and Rifle.....25&5%
Primed Shells and Bullets.....15&5%
Rim Fire Cartridges.....15&5%
Rim Fire Military.....15&5%
Carpet Sweepers—
See Sweepers, Carpet.
Casters—
Bed.....Brass.....55@55&10%
Plates.....Others.....60@60&10%
Shallow.....40&10%
Deep Socket.....40&10%
Giant Truck Casters.....35%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%
Martin's Patent (Phoenix) 45&10%
Payson's Anti-friction.....70&70&10%
Payson's Truck.....60&10%
Socket Truck Casters.....50&10%
Stationary Truck Casters.....50&10%
Tucker's Patent, low list.....45%
Yale Casters, low list.....45%
Yale, Gem.....70%
Cattle Leaders—
See Leaders, Cattle.
Cement—
Victor Elastic.....5 m palls \$ m 5¢
Chain—
Trace, Wagon and Fancy Chains,
List revised May, 1893.....60@60&10%
American Coll, in cask lots,
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4
\$7.60 5.30 4.45 3.80 3.65 3.50 3.40 3.25
Less than cask lots, add 4%
German Coll, list July 12, 1893.....60@60&10%
German Halter Chain, list July 12, 1893.....60@60&10%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%
Covert Heel Chain.....60&10%
Covert Heel Chain.....60&10%
Covert Traces.....35&5%
Galvanized Pump Chain.....50&10%
5-ton lots.....\$ 100 m \$5.50
1-ton lots.....\$ 100 m \$5.75
500-m lots.....\$ 100 m \$5.75
Less than 500 m.....\$ 100 m \$7.00
Jack Chain, Iron and Brass, list July
10, 1893.....60&10%
Onoda Halter Chain.....60@60&10%
Chalk—
See also Crayons.
Blue, case lots.....\$ gr 75¢; mail lots 80¢
Red, case lots.....\$ gr 87¢; mail lots 72¢
White, case lots.....\$ gr 50¢; mail lots 42¢

Chalk Lines—See Lines.

Chisels—
 Socket Framing and Firmer
 Mix
 New Haven
 Ohio Tool Co. 75&100 75&100 100
 P. S. & W
 Witherby
 Buck Bros. 30%
 Douglass 75&100 75&100 100
 Merrill 80&100 80&100 100
 L. & J. White 30&100 30&100 100

Tanged and Miscellaneous
 Buck Bros. 30%
 Butchers' 4.75&5.00 to 2
 Cold Chisels, fair quality, 1/2 14&16
 Spear & Jacksons 50 to 2
 Tanged Firmers 50&100 50&100 100

Chucks
 Beach Pat. each, \$8.00. 20%
 Danbury each, \$6.00, 30&30 35%
 Graham Patent 33 1/2
 Morse's Adjustable, each, \$7.00, 20&20 25%
 Syracuse, Balz Pat. 25%
 Slinger's Patent Chucks. 33 1/2
 Combination Lathe Chucks. 15%
 Drill Chucks 15%
 Independent Lathe Chucks. 40%
 Universal Lathe Chucks. 40%
 Union Mfg. Co.
 Combination 40%
 Independent 40%
 Universal 40%
 Victor 38.50, 25%

Churns
 McDermid Star Barrel Churn, each
 6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,
 \$3.00; 20 gal., \$3.25.
 Tiffin Union, each, 6 gal. \$3.25; 7 gal.,
 \$3.75; 10 gal., \$4.25.

Clamps
 Adjustable, Cincinnati. 15&10%
 Adjustable, Hammers. 15&10%
 Adjustable, Stearns'. 30&30 10%
 Barnes' Machine's Clamps. 33 1/2
 Cabinet, Sargent's. 70&10%
 Carpenter's, Cincinnati. 25&10%
 Carriage Makers', P. S. & W Co. 40&10%
 Carriage Makers', Sargent's. 75&75 25%
 Eberhard Mfg. Co. 40&50 40&10%
 R. I. Tool Co.'s Wrought Iron. 25%
 Saw Clamps, see Vices, Saw Filers'.
 Stearns' Adjustable Cabinet and Cor-
 ner 30&30 10%
 Warners'. 40&10 40&10 5%
 Cleavers, Butchers'—
 Beatty's. 40&40 5%
 Bradley's. 25&30%
 Foster Bros. 30%
 New Haven Edge Tool Co.'s. 40%
 P. S. & W. 33 1/2 5%
 Schulte, Lohr & Co. 40&40 5%
 L. & J. White. 20&25%

Clips
 Baker Axle Clips. 25%
 Norway, Axle, 1/4 & 5-16. 55&55 25%
 Norway Spring Bar Clips, 5-16. 60&55 25%
 24 grade Norway Axle, 1/4 & 5-16. 65&55 25%
 Steel Felloe Clips. 60&55 25%
 Superior Axle Clips. 60&55 25%
 Wrought Iron Felloe Clips. 60&55 25%

Cloth and Netting, Wire
 —See Wire, etc.

Cockeyes
 Cocks Brass—
 Hardware list (Globe, Kerosene, Lever
 Bibbs, Racking, etc.) 60&20 60&10

Coffee Mills—See Mills, Coffee.

Collars Dog
 Brass, Pope & Stevens' list. 40%
 Chapman Mfg. Company, new list. 40%
 Embossed, Gilt, Pope & Stevens' list. 30&1%
 Leather, Pope & Stevens' list. 40%
 Medford Fancy Goods Co. 40&10 50%

Combs Curry
 American Curry Comb Co. 33 1/2 40%
 Fitch's. 50&100 60&10 10%
 Kohler's Humane. 40%
 Kohler's Magic Oscillating. 40%
 Rubber, per doz., \$10.00. 25%

Compasses, Dividers & C.
 Compases, Dividers, 70&10 75%
 Bemis & Call Co's
 Dividers 65%
 Callipers, Call's Patent Inside 65%
 Callipers, Double 65%
 Callipers, Inside or Outside 65%
 Callipers, Wing 60%
 Compases 60%
 Excelsior 60%
 Starrett's 60%
 Combination Dividers 25%
 Lock Callipers and Dividers 25%
 Spring Callipers and Dividers 25%
 Stevens & Co's 25%
 25&10%

Coilers, Water
 S. S. Co. 2 gal., \$2.00; 3 gal., \$2.50;
 4 gal., \$2.75; 6 gal., \$3.40 each. 33 1/2

Coopers' Tools
 —See Tools, Coopers'.

Cord Sash
 Braided, Crown Drab and Fancy, 1/2
 55¢.
 Braided, Crown White, 1/2 50¢.
 Cable Laid Italian Sash, 1/2 19&20
 Common 1/2 8 1/2
 Common Russia Sash, 1/2 12 1/2
 Egyptian, India Hemp, Braided, 1/2 26¢
 India Cable Laid Sash, 1/2 11 1/2
 Massachusetts, White, 1/2 26¢
 Ossawaun Mills—
 Braided, Giant, Drab and Fancy, 1/2
 55¢.
 Braided, Giant, White, 1/2 30¢.
 Patent, good quality 1/2 10 1/2
 Patent Russia Sash, 1/2 13 1/2
 Samson—
 Braided, Drab Cotton 1/2 42¢
 Braided, Italian Hemp 1/2 40¢
 Braided, Linen 1/2 58¢
 Braided, White Cotton 1/2 37¢
 Semper Idem, Braided, White, 1/2 26¢
 Silver Lake—
 A quality, Drab, 55¢.
 A quality, White, 50¢.
 B quality, Drab, 35¢.
 B quality, White, 30¢.
 Sylvan Spring, Extra Braided, Drab, 39¢
 Sylvan Spring, Extra Braided, White, 34¢
 Tate's Solid Braided—
 Economy, Drab, 27¢
 Economy, White, 22¢
 Hercules, Drab, 20¢
 Hercules, White, 25¢
 White Cotton Braided, fair, 1/2 23&24

Wire Picture
 Braided or Twisted. 80&25 80&15%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters
 —See Knives, Corn.

Crackers, Nut
 Acme.
 Japanned, 1/2 gro., \$30. 50%
 Nickel Plated, 1/2 gro., \$30. 50%
 Blake's Pattern, 1/2 doz., \$2.00. 10%
 Table (H. & B. Mfg. Co.) 40%
 Turner & Seymour Mfg. Co. 50%

Cradles
 Grain. 50&2 50&5 25%

Crayons
 White Crayons, 1/2 gross. 7&8¢
 D. M. Steward Mfg. Co.
 Metal Workers', 1/2 gross, \$2.50. 25%
 Rolling Mill, 1/2 gross, 2.50. 25%
 Soapstone Pencils, 1/2 gross, 1.50. 25%
 See also Chalk.

Creamery Pails—See Pails, Creamery.

Crow Bars—See Bars, Crow.

Curry Combs
 —See Combs, Curry.

Curtain Pins
 —See Pins, Curtain.

Cutters
 Meat—
 American. 30%
 Nos. 1 2
 Enterprise. \$5 \$7 \$10 \$25 \$50 \$80
 Nos. 10 12 22 \$3 42
 Each. \$3 \$2.50 \$4 \$6 \$15
 Dixon's, 1/2 doz. 40&40 25%
 Nos. 1 2 3 4
 Draw Cut, each. \$14.00 \$17.00 \$19.00 \$30.00
 Nos. 5 6 8
 Hale's, 1/2 doz. \$50 \$75 \$80 \$225. 20&25%
 Nos. 11 12 13
 Home No. 1, 1/2 doz., \$26.00. 55&10%
 Little Giant, 1/2 doz. 40&10 50%
 Nos. 305 310 312 320 322
 \$35.00 \$48.00 \$44.00 \$72.00 \$88.00
 Miles' Challenge, 1/2 doz. 45&45 10%
 Nos. 1 2 3
 Triumph No. 505, 1/2 doz., \$21.00. 25&30%
 Woodruff's, 1/2 doz. 40&40 25%
 Nos. 1 2 3
 Beef Shavers (Enterprise) 20%
 Chadborn's Smoked Beef Cutter, 1/2 doz.,
 \$66.00

Slaw and Kraut
 Tucker & Dorsey Mfg. Co.:
 Kraut Cutters, 1/2 gross, \$3.00. 40%
 Slaw Cutters, 1/2 gross, \$3.00. 40%
 Slaw Cutters, 2 Knife, 1/2 gross, 30.00

Tobacco
 Acme. 1/2 doz., \$20.00. 40%
 All Iron. 1/2 doz., \$4.25
 Champion. 20&10 30%
 Nashua Lock Co.'s, 1/2 doz., \$18.00. 55&10%
 Sargent's, 1/2 doz., \$24.00. 55&10%
 Wilson's. 55%

Washer
 Appleton's. 1/2 doz., \$16.00. 60&10%
 Bonney's. 1/2 doz., 30&10%
 Cincinnati. 25&10%
 Johnson's. 1/2 doz., \$11.00. 33 1/2
 Penny's, 1/2 doz., Pol. \$14 Jap'd, \$16, 55%
 Smith's Pat. 1/2 doz., \$12.00. 20&10 10%

Diggers, Post Hole, & c.
 Cronk's Post Bars, 1/2 doz., \$60.00. 50&10%
 Eureka Diggers. 1/2 doz., \$12.00. 60&10%
 Fletcher Post Hole Augers, 1/2 doz., \$36.00,
 20&20 10%
 Gem, Improved 1/2 doz., \$9.00. 60&10 10%
 Gibbs' Columbia. 1/2 doz., \$13.00.
 Gibbs' Imperial. 1/2 doz., \$7.50.
 Gibbs' National. 1/2 doz., \$12.00.
 Gibb's Post Hole Digger. 1/2 doz., \$15.00.
 Kohler's Hercules. 1/2 doz., \$14.00.
 Kohler's Invincible. 1/2 doz., \$12.00.
 Kohler's Little Giant. 1/2 doz., \$18.00.
 Kohler's New Champion. 1/2 doz., \$8.00.
 Samson, 1/2 doz., \$34.00. 25&25 10%
 Shimer's Hollow Handle. 1/2 doz., \$18.00.
 Vaughan's Post Hole Auger, 1/2 doz.,
 \$8.50. \$9.50

Dividers—See Compases.

Dog Collars—See Collars, Dog.

Door Checks
 —See Checks, Door.

Door Springs
 —See Springs, Door.

Drawers
 Money, 1/2 doz. \$18&20
 Waddell's Improved, No. 1, 1/2 doz., \$15.00.
 Waddell's Improved No. 2, 1/2 doz., \$18.00.
 Waddell's Desk and Drawer, each, \$7.50
 Waddell's Desk and Show case, each, \$7.50

Drawing Knives
 —See Knives, Drawing.

Drills and Drill Stocks
 Blacksmiths' 1/2 doz., each \$1.75
 Blacksmiths' Self-Feeding, each \$7.50, 30%
 Automatic Boring Tools. 1.75&1.35
 Breast, Bartholomew's, each \$2.50
 Breast, Millers Falls, each \$3.00, 25%
 Breast, P. S. & W. 40&10%
 Breast, Wilson's. 30&5%
 Chicopee Automatic Drill. 20&10%
 Goodell Automatic Drills. 40&5%
 Ratchet, Curtis & Curtis. 30%
 Ratchet, Ingersoll's. 25%
 Ratchet, Merrill's. 20&20 25%
 Ratchet, Moore's Triple Action. 20&20 25%
 Ratchet, Parker's. 20&20 25%
 Ratchet, Weston's. 20&20 25%
 Ratchet, Whitney's. 20&10%
 Whitney's Hand Drill, Plain, \$11.00;
 Adjustable, \$12.00. 20&10%

Twist Drills
 Cleveland. 50&10 10%
 Diamond, W. & P. 50&10 10%
 Graham's Pat. Groove Shank 50&10 10%
 Morse. 50&10 10%
 New Process. 50&10 10%
 Standard. 50&10 10%
 Syracuse (Metal list). 50&10

Drill Bits or Bit Stock
 Drills—See Augers and Bits.

Drill Chucks—See Chucks.

Dripping Pans
 —See Pans, Dripping.

Drivers, Screw
 Allard's Spiral, new list. 25%
 Brass Screw Drivers. 25&10%
 Buck Bros. 30%
 Buck Bros' Screw Driver Bits. 27 1/2 25%
 Clark's Pat. 30&33 1/2
 Cincinnati. 25&10%
 Champion. 25&10%
 Diablon's. 50%
 Douglas Mfg. Co. 30&20 10%
 Ellrich's Socket and Ratchet. 25&25 10%
 Fray's Hol. H. dle Seta. No. 3, \$12.00. 35%
 Gay & Parsons. 45%
 Goodell's Automatic. 50%
 Knapp & Cowles
 No. 1. 60&20 70%
 No. 2. 60&10 10%
 No. 3. 60&5 10%
 Nos. 4 and 60, Acme and Ideal. 50&5%
 50&10 5%
 Kolb's Common Sense. 1/2 doz., \$3.00. 25&10%
 Mayhew's Black Handle. 50%
 Mayhew's Monarch. 45&10%
 No. 1, Forged Blade. 60&10 10%
 Nos. 20, 40 and 60. 60&10 10%
 Screw Driver Bits, Farr's. 1/2 gross, \$6.25
 Screw Driver Bits. 1/2 doz., 50&75¢
 Stanley R. & L. Co.'s
 No. 64, Varnished Handles. 65&10%
 No. 86. 70&10%
 Stearns'. 25&10 5%
 Syracuse Screw Driver Bits. 30&30 5%
 C. T. Williamson Wire Novelty Co. 60%

Egg Beaters—See Beaters, Egg.

Egg Poachers
 —See Poachers, Egg.

Electric Bell Sets
 —See Bells, Electric.

Emery—No. 4 to No. 54 to Flour, CF
 46 gr. 150 gr. F.F.F.
 10-1/2 cans, 10 6 5 4
 In case, 10 6 5 4
 10-1/2 cans, less
 than 10 10 6 7 1/2
 Kegs, 1/2 doz. 4 1/2 5 2 1/2
 1/4 kegs, 1/2 doz. 4 1/2 5 2 1/2
 1/8 kegs, 1/2 doz. 5 5 5 5

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins
 —See Pins, Escutcheon.

Escutcheons
 Brass Thread. 60&60 10%
 Door Lock. Same dis. as Door Locks.
 Wood. 25%

Expanded Metal
 List No. 5.
 Door Mats, Galvanized. 25%
 Fencing, Painted Sheets. 20%
 Lathing. 10%
 Netting, Painted Sheets. 20%
 Tree Guards, Paneled. 15%
 Window Guards, Paneled. 15%

Extractors, Lemon Juice
 —See Squeezers, Lemon.

Fasteners, Blind
 Austin & Eddy No. 2008. 1/2 gr., \$9.00.
 Mackrell's, 1/2 doz., \$1.00. 20&20 10%
 Security Gravity. 1/2 gr., \$9.00.
 Van Sand's Old Pat. \$15 1/2 gr. 55&10%
 Van Sand's Screw Pat. \$15 1/2 gr. 60&10%
 Zimmerman's. 60&10%

Faucets
 B. & B. Co.
 West's Lock, Open and Shut Key. 50%
 Burnside's Red Cedar. 50%
 Burnside's Red Cedar, bbl. lots. 50&10%
 Cork Lined. 70&50 70&10%
 Kenn's. 40%
 Penn's Cork Lock. 33 1/2
 Fray's Pat. Petroleum. 60&10%
 Metallic Key, Leather Lined. 60&10%
 60&10 10%

John Sommers'
 Peerless Best Block Tin Key. 40%
 IXL, 1st quality, Cork Lined. 50%
 Diamond Lock. 40%
 Perfection File, Red Cedar in boxes. 40%
 Boss Metallic Key. 50%
 Reliable Cork Lined. 60%
 O. K. Western Pattern Cork Lined. 50%
 No Brand, Red Cedar (in bbls.). 50&10%
 Western Pattern Metal Key. 40%
 No Brand Metal Key. 60%
 Self Measuring
 Enterprise, 1/2 doz., \$36.00. 20%
 Lane's 1/2 doz., \$36.00. 25&10%
 Star. 60%
 Star, Metal Plug, new list. 40%
 Lockport, Metal Plug, reduced list. 60%

Felloe Plates
 —See Plates, Felloe.

Fibre Ware—See Ware, Fibre.

Fifth Wheels
 Derby and Cincinnati. 45&5%
 Brewster. 50&5%

Files
 Domestic—
 American. 66 1/2 10 66 1/2 10 5 1/2
 60&10 5 60&10 10 10 10
 Bagle. 80&10 10 80&10 10 70%
 G. & H. Barnett (Black Diamond)
 60&10 60&10 5 60%
 Nicholson Files, Files, & c. 60&10 10 5 60%
 Nicholson (X.F.) Files. 60&10 10%
 Nicholson's Royal Files (Seconds). 75%
 extra prices on certain sizes.
 Other makers, best brands. 60&10 5 70%
 Fair brands. 70&10 70&10 10 10%
 Second quality. 80&80 5%
 Arcade Horse Rasps. 60&10 60&10 5%
 Chelsea Horse Rasps, Hand Cut. 60&10%
 Heller's Horse Rasps. 60&10 60%
 McCaffrey's Horse Rasps. 60&10%
 Trojan Horse Rasps. 60&10 5%

Imported
 Butcher. Butcher's list, 20%
 Stubb's list 25&30 10%

Fixtures Grindstone
 Moore's. 55%
 P. S. & W Co. 60&10%
 Reading Hardware Co. 60&10%
 Sargent's Patent. 70&10%

Fluting Machines
 —See Machines, Fluting.

Fluting Scissors
 —See Scissors, Fluting.

Fodder Squeezers
 —See Squeezers, Fodder.

Forks
 Hay, Manure, & c. Asso. List, 70&70 5 25%
 Hay, Manure, & c. Phila. List, 60&60 10 5 25%
 Plated, see Spoons.

Frames
 Saw—
 Red, Polished and Varnished. 1/2 doz., \$1.50, 25%
 White Vermont. 1/2 gro., \$9.00. \$10.00.

Screen, Window and Door
 Bonanza Window Screens. 50&50 60&10%
 Cortland. 40&40 5%
 Empire Fancy Screen Doors. 1/2 doz. \$12
 Phillips' Window Screen Frames. 50&50 25%

Porter's Pat. Window and Door Frames
 33 1/2 10%
 Stearns' Frames and Corners. 25&25 10%
 Warner's Screen Corner Irons. 33 1/2 10%

Freezers, Ice Cream
 American. 60%
 Arctic. 70&70 5%
 Bazzard. 40%
 Boss and Pat. 60&10 10 10%
 Buffalo Champion. 65&65 5%
 Confectioners' Machine. 50%
 Crown. 60%
 Double Action Crown. 60%
 Gen. 60%
 Gant. 60%
 Good Luck. 65&65 5%
 Granite State. 65&65 5%
 Keystone, P. D. & Co., each, \$1.50. 20%
 Model. 60&60 5%
 Peerless. 60&10%
 Shepard's Lightning. 65&65 5%
 Standard. 60&60 5%
 Standard Double Action. 60&60 5%
 Star. 60%
 White Mountain. 60&60 5%
 Zero. 70%

Fruit and Jelly Presses
 —See Presses, Fruit and Jelly.

Fruit Pickers
 —See Pickers, Fruit.

Fry Pans—See Pans, Fry.

Funnels
 Gersdorf's Perfection, Standard and
 Globe; Tyn, 1 gro., 10%; 2 to 5 gro.,
 20%; 5 to 10 gro. 30%
 Copper, 1 to 6 doz., 15%; 6 to 12
 doz., 20%; over 12 doz. 25%

Furnaces, Soldering
 Burgess No. 3 Gem, Copper reservoir. \$8.50
 Burgess No. 3 Gem tin reservoir. \$7.00
 Clayton & Lambert No. 1 Fire-Pot,
 complete. \$5.00
 Fuse, Dis. @ 25¢ cash. 1/2 doz. \$10.00
 Common Cotton Fuse, for dry ground. \$3.00
 Common Hemp Fuse, for dry ground. 2.80
 Double Taped Fuse, for very wet gr. 5.60
 Single Taped Fuse, for wet ground. 4.75
 Triple Taped Fuse, for very wet gr. 6.40
 Large Gutta Percha Fuse, for water. 15.00
 Small Gutta Percha Fuse, for water. 10.00

Gates Molasses
 Boss, 1/2 doz.:
 No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4,
 \$10
 Lincoln's Pattern. 70&70 10%
 Stebbins' Genuine. 60&60 10%
 Stebbins' Pattern. 80&10 80&10 5%
 Stebbins' Tinned Ends. 40&10%
 Weed's. 20&10%

Gauges
 Barrett's Comb. Roller Gauge. 1/2 doz. \$8.00. \$8.50
 Hoague & Peck's Champion Gauge,
 With Scale. 1/2 doz. \$5.00.
 Without Scale. 1/2 doz. \$4.00.
 Marking, Mortise, & c. 60&10%
 Stanley K. & L. Co.'s Butt and Rabbit
 Gauge. 20&10%
 Starrett's Surface, Center and Scratch
 Gauge. 25&10%
 Wire, Brown & Sharpe's. 10&20%
 Wire, Morse's. 25%
 Wire, P. S. & W Co. 10&10%
 Wire, Wheeler, Madden & Co. 10%

Gimlets
 Nail and Spike. 50&10 5%
 Diamond Gimlet. 1/2 doz. \$5.00.
 Eureka Gimlets. 60&10%
 Double Cut, Douglass'. 40&10%
 Double Cut, Ives'. 60&60 5%
 Double Cut, Shepardson's. 45&45 5%
 Glue—
 Todd's Liquid Glue. 25&25 5%
 Improved Process. 25&25 5%
 Le Page's Liquid. 25&25 5%
 Upton's Liquid. 35%

Glue Pots—See Pots, Glue.

Grease, Axle
 Axle, tin boxes. 1/2 gross \$12.00.
 Dixon's Everlasting. 10-b tin pails, ea. 85¢
 Dixon's Everlasting, in bxs. 1/2 doz 1 m
 \$1.20; 2 m \$2.00
 English Coach, 5-b tin pails, 1/2 doz, \$3.50
 English Coach, wooden boxes. 50%
 Fraser's. 1/2 keg 1/2 4¢, 1/2 4¢, 1/2 4¢
 Fraser's, in boxes. 1/2 gr \$9.50
 Lower grades, special brands. 1/2 gr \$5.50. \$7.00
 Tiger, 5-b tin pails. 1/2 doz \$2.85
 Tiger, wooden boxes. 1/2 gross \$7.00

Grindstones
 Family, regular list. 60%
 Family, Cleveland Stone Co. 20%
Grindstone Fixtures
 —See Fixtures, Grindstone.

Gun Powder—See Powder.

Hack Saws—See Saws.

Hatts, Awl
 Sewing, Brass For. 1/2 gr. \$1.75
 Pat. Sewing, Long. 1/2 doz \$1.30
 Pat. Sewing, Short. 1/2 doz. 45&50%
 Pat. Sewing, 1/2 doz. 45&50%
 Pat. Peg, Plain Top 1/2 doz. 40&45%

Halters—
 Covert's Adj. Rope Halters.....40&24
 Covert's Adj. Web Halters.....35&5&24
 Covert's Hemp Horse and Cattle Tie.....50&10&24
 Covert's Jute Cattle Ties.....70&24
 Covert's Jute Horse Ties.....70&24
 Covert's Rope, 7-16 in., Jute.....50&24
 Covert's Rope, 7-16 in., Hemp.....50&24
 Covert's Rope, Jute.....60&10&10&24
 Covert's Saddlery Works Halters.....33&4
 Covert's Saddlery Works Handy Web Halters.....33&4
 Covert's Saddlery Works Horse and Cattle Ties.....33&4

Hammers—
Handled Hammers—
 Atha Tool Co.....
 Buffalo Hammer Co.....60&10
 Humason & Beckley.....
 Terree.....
 Cheney's.....40&10
 Cheney's Machinists' & Riveting.....50&25
 C. Hammond & Son.....40&10
 Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Heavy Hammers and Sledges—
 3 lb and under.....40&10
 3 to 5 lb.....40&10
 5 to 10 lb.....40&10
 10 to 15 lb.....40&10
 15 to 20 lb.....40&10
 20 to 25 lb.....40&10
 25 to 30 lb.....40&10
 30 to 35 lb.....40&10
 35 to 40 lb.....40&10
 40 to 45 lb.....40&10
 45 to 50 lb.....40&10
 50 to 55 lb.....40&10
 55 to 60 lb.....40&10
 60 to 65 lb.....40&10
 65 to 70 lb.....40&10
 70 to 75 lb.....40&10
 75 to 80 lb.....40&10
 80 to 85 lb.....40&10
 85 to 90 lb.....40&10
 90 to 95 lb.....40&10
 95 to 100 lb.....40&10
 100 to 105 lb.....40&10
 105 to 110 lb.....40&10
 110 to 115 lb.....40&10
 115 to 120 lb.....40&10
 120 to 125 lb.....40&10
 125 to 130 lb.....40&10
 130 to 135 lb.....40&10
 135 to 140 lb.....40&10
 140 to 145 lb.....40&10
 145 to 150 lb.....40&10
 150 to 155 lb.....40&10
 155 to 160 lb.....40&10
 160 to 165 lb.....40&10
 165 to 170 lb.....40&10
 170 to 175 lb.....40&10
 175 to 180 lb.....40&10
 180 to 185 lb.....40&10
 185 to 190 lb.....40&10
 190 to 195 lb.....40&10
 195 to 200 lb.....40&10
 200 to 205 lb.....40&10
 205 to 210 lb.....40&10
 210 to 215 lb.....40&10
 215 to 220 lb.....40&10
 220 to 225 lb.....40&10
 225 to 230 lb.....40&10
 230 to 235 lb.....40&10
 235 to 240 lb.....40&10
 240 to 245 lb.....40&10
 245 to 250 lb.....40&10
 250 to 255 lb.....40&10
 255 to 260 lb.....40&10
 260 to 265 lb.....40&10
 265 to 270 lb.....40&10
 270 to 275 lb.....40&10
 275 to 280 lb.....40&10
 280 to 285 lb.....40&10
 285 to 290 lb.....40&10
 290 to 295 lb.....40&10
 295 to 300 lb.....40&10
 300 to 305 lb.....40&10
 305 to 310 lb.....40&10
 310 to 315 lb.....40&10
 315 to 320 lb.....40&10
 320 to 325 lb.....40&10
 325 to 330 lb.....40&10
 330 to 335 lb.....40&10
 335 to 340 lb.....40&10
 340 to 345 lb.....40&10
 345 to 350 lb.....40&10
 350 to 355 lb.....40&10
 355 to 360 lb.....40&10
 360 to 365 lb.....40&10
 365 to 370 lb.....40&10
 370 to 375 lb.....40&10
 375 to 380 lb.....40&10
 380 to 385 lb.....40&10
 385 to 390 lb.....40&10
 390 to 395 lb.....40&10
 395 to 400 lb.....40&10
 400 to 405 lb.....40&10
 405 to 410 lb.....40&10
 410 to 415 lb.....40&10
 415 to 420 lb.....40&10
 420 to 425 lb.....40&10
 425 to 430 lb.....40&10
 430 to 435 lb.....40&10
 435 to 440 lb.....40&10
 440 to 445 lb.....40&10
 445 to 450 lb.....40&10
 450 to 455 lb.....40&10
 455 to 460 lb.....40&10
 460 to 465 lb.....40&10
 465 to 470 lb.....40&10
 470 to 475 lb.....40&10
 475 to 480 lb.....40&10
 480 to 485 lb.....40&10
 485 to 490 lb.....40&10
 490 to 495 lb.....40&10
 495 to 500 lb.....40&10
 500 to 505 lb.....40&10
 505 to 510 lb.....40&10
 510 to 515 lb.....40&10
 515 to 520 lb.....40&10
 520 to 525 lb.....40&10
 525 to 530 lb.....40&10
 530 to 535 lb.....40&10
 535 to 540 lb.....40&10
 540 to 545 lb.....40&10
 545 to 550 lb.....40&10
 550 to 555 lb.....40&10
 555 to 560 lb.....40&10
 560 to 565 lb.....40&10
 565 to 570 lb.....40&10
 570 to 575 lb.....40&10
 575 to 580 lb.....40&10
 580 to 585 lb.....40&10
 585 to 590 lb.....40&10
 590 to 595 lb.....40&10
 595 to 600 lb.....40&10
 600 to 605 lb.....40&10
 605 to 610 lb.....40&10
 610 to 615 lb.....40&10
 615 to 620 lb.....40&10
 620 to 625 lb.....40&10
 625 to 630 lb.....40&10
 630 to 635 lb.....40&10
 635 to 640 lb.....40&10
 640 to 645 lb.....40&10
 645 to 650 lb.....40&10
 650 to 655 lb.....40&10
 655 to 660 lb.....40&10
 660 to 665 lb.....40&10
 665 to 670 lb.....40&10
 670 to 675 lb.....40&10
 675 to 680 lb.....40&10
 680 to 685 lb.....40&10
 685 to 690 lb.....40&10
 690 to 695 lb.....40&10
 695 to 700 lb.....40&10
 700 to 705 lb.....40&10
 705 to 710 lb.....40&10
 710 to 715 lb.....40&10
 715 to 720 lb.....40&10
 720 to 725 lb.....40&10
 725 to 730 lb.....40&10
 730 to 735 lb.....40&10
 735 to 740 lb.....40&10
 740 to 745 lb.....40&10
 745 to 750 lb.....40&10
 750 to 755 lb.....40&10
 755 to 760 lb.....40&10
 760 to 765 lb.....40&10
 765 to 770 lb.....40&10
 770 to 775 lb.....40&10
 775 to 780 lb.....40&10
 780 to 785 lb.....40&10
 785 to 790 lb.....40&10
 790 to 795 lb.....40&10
 795 to 800 lb.....40&10
 800 to 805 lb.....40&10
 805 to 810 lb.....40&10
 810 to 815 lb.....40&10
 815 to 820 lb.....40&10
 820 to 825 lb.....40&10
 825 to 830 lb.....40&10
 830 to 835 lb.....40&10
 835 to 840 lb.....40&10
 840 to 845 lb.....40&10
 845 to 850 lb.....40&10
 850 to 855 lb.....40&10
 855 to 860 lb.....40&10
 860 to 865 lb.....40&10
 865 to 870 lb.....40&10
 870 to 875 lb.....40&10
 875 to 880 lb.....40&10
 880 to 885 lb.....40&10
 885 to 890 lb.....40&10
 890 to 895 lb.....40&10
 895 to 900 lb.....40&10
 900 to 905 lb.....40&10
 905 to 910 lb.....40&10
 910 to 915 lb.....40&10
 915 to 920 lb.....40&10
 920 to 925 lb.....40&10
 925 to 930 lb.....40&10
 930 to 935 lb.....40&10
 935 to 940 lb.....40&10
 940 to 945 lb.....40&10
 945 to 950 lb.....40&10
 950 to 955 lb.....40&10
 955 to 960 lb.....40&10
 960 to 965 lb.....40&10
 965 to 970 lb.....40&10
 970 to 975 lb.....40&10
 975 to 980 lb.....40&10
 980 to 985 lb.....40&10
 985 to 990 lb.....40&10
 990 to 995 lb.....40&10
 995 to 1000 lb.....40&10

Handcuffs and Leg Irons—
 See Police Goods.

Handles—
Cross-Cut Saw Handles—
 Atkins', new list.....40
 Champion.....15
 Ely's Perfection.....40
 Sensible.....40

Iron, Wrought or Cast—
 Barn Door, per doz.....10&10
 Bronze Iron Drop Latches.....40
 Chest and Lifting.....70
 Door or Thumb.....10
 Nos. 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 64

Deitz Flat Key.....30¢
Mallory, Wheeler & Co. list July, '88.
60¢100/70¢
Plate.....33¢22¢
Romer's Night Latches.....15¢
R. & E. Mfg. Co., list Mar. 20, 1889.
60¢100/70¢
Sargent & Co., list Aug. 1, '92. 60¢100/70¢
Warner's Burglar Proof. # doz. \$3.00, 50¢
Yale.....net prices

Elevator—

Moore's.....33¢4¢

Padlocks—

List June 10, 1891.....50¢22¢
Ames Sword Co. up to No. 150.....40¢
Ames Sword Co. above No. 150.....50¢
Barnes Mfg. Co.....40¢40¢10¢
Champion Padlocks.....40¢
A. E. Deitz.....40¢
Eagle.....40¢
Eureka, Eagle Lock Co.....40¢22¢
K. T. Fraim's Keystone Scandinavian.....
1010 line.....90¢25¢
120 line.....90¢25¢
108 line.....70¢10¢
510 line.....70¢
225, 610 and 209 lines.....70¢
All other numbers.....50¢25¢
Horseshoe.....# doz. \$9, 50¢50¢10¢
Hotchkiss.....30¢
Nock's.....30¢
Norwich Lock Mfg. Co., old list.....50¢22¢
Romer's No. 9 to 91.....30¢
Romer's Scandinavian, &c., Nos. 100 to
605.....15¢
Scandinavian.....90¢50¢
Slaymaker, Barry & Co.....
No. 1010 line.....90¢50¢
No. 41 line.....50¢
No. 61 line.....60¢
No. 21 line.....80¢
Star.....60¢
Yale Lock Mfg. Co.'s.....net prices

Sash, &c.—

Attwell Mfg. Co.....25¢33¢4¢
Champion Safety list January, 1893. 70¢5¢
Clark's No. 1, \$10; No. 2, \$8 gr.....33¢4¢
Common Sense, Jap'd, Cop'd and
Brzd.....gr \$4.00
Common Sense, Nickel Plated.....gr \$10.00
Corbin's Daisy, list Feb. 15, 1886.....70¢
Davis Bronze, Barnes Mfg. Co.....60¢
Ferguson's.....33¢4¢
Fish (Liescher's pat.), No. 100, # gr.....\$3;
No. 105, # gr.....\$10
Giant, list Jan. 1892.....70¢25¢
Hammond's Window Springs.....40¢
Huginin's New Sash Locks.....25¢25¢2¢
Huginin's Sash Balances.....25¢25¢2¢
Ives' Patent.....60¢10¢50¢60¢10¢10¢
Kempshall's Gravity.....60¢
Kempshall's Model.....60¢60¢10¢
Monarch.....60¢
Payson's Perfect.....60¢10¢10¢
Reading.....60¢10¢60¢80¢10¢10¢
Security.....70¢
Universal.....30¢
Walker's.....60¢10¢22¢
Wolcott's.....60¢10¢25¢

Lumber Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles.....# doz. \$1.75; 5¢
gross.....\$17.00

Machines.**Boring—**

Without Angers Upright Angular.
Douglas.....\$5.50 \$8.75.....50¢
Jennings'.....5.50 6.75.....60¢50¢5¢
Snell's, Rice's Pat.....6.50 6.75.....40¢10¢10¢
Other Machines.....2.25 2.50.....
Boss, Carpenters' 3.60
Boss, Ship Builders' 3.85
Phillips' Patent.....7.00
With Auger.....7.50
Millers Falls.....7.50.....25¢

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,
\$4.50 each.....35¢
Combined Fluter and Sad Iron.....
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,
\$5.50 each.....35¢
Crown hand Fluter, No. 1, \$15.00; 2,
\$12.50; 3, \$10.00; 4, \$8.25.....30¢
Crown Jewel, 6 in., \$3.50 each, 35¢
Domestic Fluter.....each, \$1.50
Eagle, 3 1/2 inch Rolls, \$2.15.....35¢
Eagle, 5 1/2 inch Rolls, \$2.35.....35¢
Geneva Hand Fluter, White Metal,
\$2.15.....35¢
Knox, 4 1/2 inch Rolls.....\$3.25 each
Knox, 6 inch Rolls.....\$3.60 each
Shepard Hand Fluter, No. 85, per doz
\$15.50.....40¢
Shepard Hand Fluter, No. 95, # doz
\$3.00.....40¢
Shepard Hand Fluter, No. 110, # doz
\$11.00.....40¢

Hoisting—

Moore's Anti-Friction Differential Pul-
ley Block.....20¢
Moore's Hand Hoist, with Lock Brake.....20¢
Moore's Rope Differential Pulley
Block.....60¢
Maris & Beekley (Teal Patent).....30¢
See also Blocks.

Washing—

Fair and Square.....# doz \$42.00
Anthony Wayne.....# doz, No. 1, \$42; No.
2, \$36; No. 3, \$42
Wayne American.....# doz \$36.00
Wells.....# doz \$44.00
Western Star # doz, No. 2, \$36; No. 3
\$39

Mallets—

B. & L. Block Co., Hickory & L. V.
Hickory.....20¢10¢20¢10¢10¢
Lignumvitae.....20¢10¢20¢10¢10¢

Mattocks—Regular list

60¢10¢60¢10¢5¢

Measures

Standard Fluting Ware, No. 1, peck #
dozen, \$3.50; 1/2 peck, \$3.00

Meat Cutters—

See Cutters, Meat.

Menders, Harness—

Per doz.....\$2.00

Milk Cans—See Cans, Milk.**Mills—**

Box and Side, list Jan. 1, 1888. 60¢60¢5¢
Net prices are often made which are
lower than above discount.
American, Enterprise Mfg. Co., list Jan.
17, 1893.....20¢
The Swift, Lane Bros.....30¢
Waddell's New Box Mills, Ideal
Brand, New List.....60¢

Mining Knives—

See Knives, Mining.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Out of Season.

Muzzles—

Safety.....# doz. \$3.00, 25¢

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered
Association list, May 1, '92.....35¢5¢
Tack Mfrs' list.....70¢5¢70¢10¢
Hungarian, Finishing, Upholsterers', &c.
See Tacks.

Horse—

Nos. 6 7 8 9 10
A. C.....20¢ 23¢ 22¢ 21¢ 21¢ 40¢10¢
American.....9¢ 9¢ 9¢ 9¢ 9¢ 35¢
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢ 35¢
Ausable.....28¢ 26¢ 25¢ 24¢ 23¢ 40¢5¢2¢
Capewell.....19¢ 18¢ 17¢ 16¢ 15¢ 30¢5¢
C. B. K.....25¢ 23¢ 22¢ 21¢ 21¢ 40¢
Champion.....25¢ 23¢ 22¢ 21¢ 20¢ 40¢10¢10¢
Champion.....28¢ 26¢ 25¢ 24¢ 23¢ 40¢5¢2¢
Clinton, Fin.....19¢ 17¢ 16¢ 15¢ 14¢ 30¢5¢
Empire Bronzed.....13¢14¢ 30¢5¢
Essex.....28¢ 26¢ 25¢ 24¢ 23¢ 40¢10¢60¢
Lyra.....9¢ 9¢ 9¢ 9¢ 9¢ net
Maud S.....28¢ 26¢ 25¢ 24¢ 21¢ 50¢10¢5¢
Northwest'n.....25¢ 23¢ 22¢ 21¢ 20¢ 25¢25¢5¢
Putnam.....23¢ 21¢ 20¢ 19¢ 18¢ 15¢
Snowden.....9¢ 9¢ 9¢ 9¢ 9¢ net
Sward.....23¢ 21¢ 20¢ 19¢ 18¢ 35¢
Yulcan.....23¢ 21¢ 20¢ 19¢ 18¢ 35¢
Western.....23¢ 21¢ 20¢ 19¢ 18¢ 50¢

Picture—

Brass Head, Combination list.....50¢10¢
Brass Head, Sargent's list.....60¢90¢10¢
Porcelain Head, Combination list.....40¢10¢
Porcelain Head, Sargent's list.....50¢10¢10¢
Niles' Patent.....40¢

Nail Pullers—See Pullers, Nail.**Nail Sets—See Sets, Nail.****Nut Crackers—**

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Square, Hex.
Cold Punched.....5.00¢ 6.10¢ off list
In packages of 100 lb, add 1-10¢
net; in packages less than 100 lb, add
1/2¢ # lb. net.
Hot Pressed.....5.80¢ 6.50¢ off list

Oakum—

Best or Government.....# b 6¢4¢7¢4¢
Navy.....# b 5¢2¢6¢4¢
U. S. Navy.....# b 5¢4¢6¢

Oil Tanks—See Tanks, Oil.**Oilers—**

Zinc and Tin.....65¢10¢70¢5¢
Brass and Copper.....60¢10¢50¢10¢5¢
Broughton's Brass.....30¢
Broughton's Zinc.....50¢
Malleable, Hammers' Improved No. 1,
\$3.60; No. 2, \$4.00; No. 3, \$4.40 # doz.
10¢10¢5¢
Malleable, Hammers' Old Pattern, same
list.....45¢
Cincinnati's Brass and Copper.....60¢
Cincinnati's Tin and Zinc.....60¢
Prior's Pat. or "Paragon" Zinc.....60¢
Prior's Pat. or "Paragon" Zinc.....60¢
Steel, Draper & Williams.....60¢10¢10¢
Wilnot & Hobbs Mfg. Co., Steel Anti-
Rust.....60¢

Openers, Can—

American.....# gross \$1.75 to \$2.00
Champion.....# doz \$2.00.....60¢
Domestic.....# doz \$2.00.....45¢
Duplex.....# doz 25¢, 15¢20¢
Eureka.....# doz \$2.50, 10¢
Excelsior, No. 1, \$2.50; No. 2, \$1.50.....40¢
Lyman's.....# doz \$3.75, 20¢
Messenger's Comet.....# doz \$3.00, 20¢
Moore's.....70¢
No. 4, French.....# doz \$2.25, 55¢60¢
No. 5, Iron Handle.....# gr \$8.00, 45¢60¢
Sardine Scales.....# doz \$2.75 to \$3.00
Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢
Star.....# doz \$2.75
Universal.....# doz \$3.00.....55¢5¢
World's Best # gross, No. 1, \$12.00;
No. 2, \$24.00; No. 3, \$36.00.....60¢10¢

Packing, Steam—

Rubber—
Standard, fair quality.....70¢70¢10¢
Inferior quality.....75¢80¢
Extra.....# gr \$0.60 to \$0.85
Jenning's Standard.....# 80¢.....25¢25¢5¢
N. Y. B. & P. Co., Empire.....60¢
N. Y. B. & P. Co., Salamander.....25¢
N. Y. B. & P. Co., Standard.....60¢

Miscellaneous—

American Packing.....10¢11¢ # b
Cotton Packing.....15¢17¢ # b
Italian Packing.....13¢14¢ # b
Jute.....7¢8¢ # b
Russia Packing.....14¢ # b

Pails—

S. S. & Co.—18 qt., \$7.00; 20 qt., \$7.25
doz.....5¢

Galvanized—

Quarts 10 12 14
Central Stamping Co.....2.50 2.75 3.00
Fire Buckets.....2.75 3.25 3.50
Hill's Heavy Weight # da. 3.00 3.25 3.75
Hill's Light Weight, # doz. \$2.75 3.00 3.25
Iron Clad.....2.50 2.75 3.00
Sidney Shepard & Co.....2.50 2.75 3.00
Buckets—See Well Buckets.

Indurated Fiber Ware

Fire Pails, deep.....# doz \$4.80
Fire Pails, round bottom.....# doz \$5.40
Milk, 14 qt.....# doz \$5.40
Stable, 14 qt.....# doz \$6.00
Star Pails, 12 qt.....# doz \$4.20

Standard Fiber Ware—

Buggy Pails.....\$3.00 Plain, Deord
Chamber Pails, 14 qt.....4.00 \$7.00
Dairy Pails, 14 qt., # doz. 3.75 4.25
Fire Pails, No. 1, 12 qt., # doz. 3.75
Fire Pails, No. 2, 12 qt., # doz. 4.35
Horse Pails.....4.00
Slop Jars (bal. trap).....7.50 8.50
Sugar Pails.....5.50 5.50
Water Pails, 12 qt., # doz. 3.15 3.75

Pans—**Dripping—**

Large sizes.....# b 5¢
Small sizes.....# b 6¢
Silver & Co. (Covered).....40¢

Fry—

Standard List:
No.....1 2 3 4
doz. \$3.00 \$3.75 \$4.25 4.75 \$5.25
No.....6 7 8
doz. \$6.00 \$7.00 \$8.00 \$9.00
Polished, regular goods.....75¢75¢10¢
Acme Fry Pans.....60¢4¢

Dust—

Steel Edge, No. 1.....# doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, 12; 20,
\$2.50; 30, \$2.60 each.....60¢10¢

Paper and Cloth—**Sand and Emery—**

List April 19, 1888.....50¢10¢50¢10¢10¢
Sibley's Emery and Crocus Cloth.....30¢

Parers—**Apple—**

Advance.....# doz \$4.75
Baldwin.....# doz 5.25
Bonanza.....each 5.00
Daisy.....# doz 4.00
Eureka.....each 7.50
Eclipse.....# doz 4.00
Eureka, 1888.....each 18.00
Family Bay State.....# doz 12.00
Favorite.....# doz 5.00
Gold Medal.....# doz 4.00
Ideal.....# doz 4.00
Improved Bay State.....# doz 27.00
Little Star.....# doz 4.00
Monarch.....# doz 13.50
New Lightning.....# doz 5.50
Oriole.....# doz 4.00
Penn.....# doz 3.00
Perfection.....# doz 4.00
Pomona.....# doz 4.00
Reading 72.....# doz 4.25
Reading 78.....# doz 7.00
Rocking Table.....# doz 6.00
Turn Table.....# doz 4.50
Victor.....# doz 13.50
Whorlery.....# doz 4.00
White Mountain.....# doz 4.00

Potato—

Antrim Combination.....# doz \$5.50
Booster.....# doz \$3.50
Sarotoga.....# doz \$5.50
White Mountain.....# doz \$4.50

Pencils, Soapstone—**Pickers, Fruit—**

Prize Fruit Pickers.....50¢
Pickers—
Railroad or Adze Eye, 5 to 6, \$12.00; 6
to 7, \$13.00.....60¢10¢5¢60¢10¢10¢5¢

Picture Nails—**Pinking Irons—****Pins—**

Humason, Beekley & Co.'s.....60¢10¢
Humason, W. Co.....60¢10¢50¢10¢25¢
Sargent & Co.'s, \$17 and \$18.....60¢10¢
Escutcheon—
Iron, list Nov. 11, 1885. 60¢10¢50¢10¢5¢
Brass.....60¢60¢5¢

Pipe, Wrought Iron—

List April 13, 1893.
1 1/2 and under, Plain.....57¢4¢10¢
1 1/2 and under, Galv.....50¢10¢
1 1/2 and over, Plain.....67¢4¢10¢
1 1/2 and over, Galv.....67¢4¢10¢
Boiler Tubes, list Oct. 24, 1892.....65¢10¢
Casing, list Nov. 16, 1892.....52¢4¢10¢
Cold Drawn Seamless Steel Tubing.....50¢
Inserted Joints Casing, list Nov. 16,
1892.....47¢4¢5¢
Steel Boiler Tubes.....27¢4¢5¢

Planes and Plane Irons—**Wood Planes—**

Molding.....40¢10¢
Bench, First quality.....45¢10¢
Bench, Second quality.....50¢10¢
Bailey's (Stanley R. & L. Co.).....50¢10¢

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50¢10¢
Birmingham Planer.....50¢50¢5¢
Chaplin's Iron Planes.....50¢50¢5¢
Davis' Iron Planes.....50¢50¢5¢
Gage Tool Co.'s Self-Setting.....20¢10¢10¢
Meriden Mal. Iron Co.'s.....50¢50¢5¢
Miscellaneous Planes (Stanley R. & L.
Co.).....25¢10¢
Sargent's.....50¢10¢
Standard Tool Co.....50¢50¢5¢
Steers' Iron Planes.....50¢50¢5¢
Auburn Thistle.....30¢10¢30¢10¢10¢
Buck Bros.....50¢10¢
Butchers.....\$5.00 to \$5.25 to a

Ohio.....30¢10¢30¢10¢10¢
Sandusky.....50¢10¢
Stanley R. & L. Co.....50¢10¢
L. & J. White.....25¢

Plates—

Felcoe.....# b 6¢6¢4¢

Pliers and Nippers—

Button's Patent.....60¢
Cawley's Pat. Wire Cutters.....20¢
Cronk's In., \$15.00; 10 in.....50¢10¢10¢
Cronk's Button Pattern.....50¢10¢10¢
Cronk's Carrier Pliers.....60¢60¢5¢
Eureka Pliers and Nippers.....40¢
Gas Pliers.....60¢
Gas Pliers, Custer's Nickel Plated.....60¢5¢
Hall's No. 2, 5 in., \$18.50; No. 4, 7 in.,
\$21.00 # d.....40¢
Humason & Beekley Mfg. Co. 50¢50¢10¢
Lindsay's Giant.....30¢
Morrill's Parallel, # doz. \$12.00.....30¢5¢
P. S. & W. Cast Steel.....50¢50¢5¢
P. S. & W. Timmers' Cutting Nippers,
add 6¢.....10¢
Russell's Parallel.....25¢

Plumbs and Levels—

Regular List.....75¢10¢75¢10¢10¢
Cook's.....40¢10¢
Davis Inclinoimeters.....10¢10¢
Davis Iron Levels.....30¢
Daston's.....70¢10¢70¢10¢10¢
Stanley's Duplex.....20¢10¢
Stanley's Handy.....20¢10¢

Poachers, Egg—

Buffalo Steam Egg Poachers, # doz.
No. 1, \$6.00; No. 2, \$8.00.....33¢4¢
Silver & Co., 6-ling, # doz. \$4.00.....\$2.00
Ring.....\$2.00

Pokes, Animal—

Bishop's American.....# doz \$3.00
Bishop's I. L. L.....# doz \$3.00
Bishop's Monarch.....# doz \$4.50
Bishop's Pioneer.....# doz \$3.00
Bolding.....# doz \$3.00
Buckeye, Single Stale.....# doz \$2.75
Eagle, Double Stale.....# doz \$5.75
Eagle, Single Stale.....# doz \$3.75
Metallic Horse Poke.....# doz \$6.00

Police Goods—

Daley's Improved Handoffs; 2 Hands,
Polished, # doz. \$48.00; Nickelcd,
\$57.00; 3 hands, Polished, # doz.
\$72.00; Nickelcd, \$84.00.....25¢
J. P. Lovell's Police Goods.....25¢
R. I. Tool Co., Handoffs, \$15.00 # doz 10¢
R. I. Tool Co., Leg Irons, \$25.00 # doz 10¢
Towers's.....25¢

Polish—

Gaston's Silver Compound.....33¢4¢
Prestoline.....30¢
Prestoline Paste.....33¢4¢

Stove—

Black Eagle Benzine Paste, 5 and 10 lb
cans.....12¢4¢
Black Flag.....# gro \$7.20
Black Flag, 5 and 10 lb pails.....# 12¢
Black Flag, liquid, in bottles, # gro \$8.00
Black Jack Water Paste, 5 and 10 lb
cans.....12¢4¢
Bonnell's Liquid Stove Polish, # gro \$9.00
Bonnell's Paste Stove Polish, # gro \$8.00
Boynton's Noon Day.....# gro \$13.00
Crown Paste.....# gro \$7.20
Crown Paste in 5 and 10 lb pails, # 12¢
Diamond O. K. # gro \$19.00
Diamond Rock Nickel Cleaner.....# gro \$10.20
Joseph Dixon's.....# gro \$6.00, 10¢
Dixon's Plumbago.....# b 8¢
Fireside.....# gro \$2.50
Gem.....# gro \$4.50, 10¢
Gold Medal.....# gro \$2.50
Japanese.....# gro \$3.50
Jet Black.....# gro \$3.50
Lustro.....# gro \$4.75
Nickel Plate Paste.....# gro \$6.00
Parlor Pride Stove Enamel, # gro,
Raven Liquid, 6 oz. bottles.....# gro \$8.00

Raven Liquid, 8 oz. bottles.....# gro \$9.00

Raven Paste in 5 lb. pails (cases of.....
6 pails), # m 10¢

Raven Water Polish, large boxes.....# gro \$7.20

Rising Sun, 6 gro lots.....# gro \$5.50

Ruby.....# gro \$9.75

Ruby's Liquid, 2 3 5 10 gal
gal. \$0.80 .70 .60 .50

Yates Standard Paste Polish, 10 lb cans,
m 12¢4¢

Poppers, Corn—

Round or Square,
1 qt.....# doz \$1.00; # gr \$3.00
1 1/2 qt.....# doz \$1.00; # gr \$9.00
2 qt.....# doz \$1.50; # gr \$14.00

Post Hole and Tree Augers and Diggers—

See Diggers, Post Hole, &c.

Potato Parers—

See Parers, Potato.

Pots—**Glue—**

Enameled.....40¢10¢40¢10¢5¢
Family, Howe's.....40¢
Family

Pullers Nail-

Scranton. \$18.00, 88¢
 Giant, No. 1. \$18.00, 10¢
 Giant, No. 2. \$15.00, 10¢
 Pelican. \$20.00, 25¢
 Eclipse. \$24.00, 40¢
 Economy. \$24.00, 40¢

Pulleys-

Hot House, Awning, &c. 65¢@70¢
 Japanned Screw. 60¢@10¢
 Brass Screw. 70¢
 Japanned Side. 60¢@10¢
 Moore's Side, Anti-Friction. 50¢
 Moore's Ceiling or End, Anti-Friction. 40¢
 Moore's Dumb Waiter, Anti-Friction. 50¢
 Moore's Electric Light. 35¢
 Japanned Clothes Line. 60¢@10¢
 Hay Fork, Solid Eye. \$4.50
 Hay Fork, "Anti-Friction," 5 in. solid. \$6.70
 Hay Fork, "P" Common and Patent. 20¢
 Hay Fork, Tarbox Self Iron. 20¢
 Hay Fork, Rees' Self Lubricating. 30¢
 Hay Fork, Moore's Anti-Friction 5 in. 40¢
 Wheel, \$12.00. 40¢
 Shade Rack. 45¢
 Tackle Blocks-See Blocks.
 Shepard's Niagara, No. 25. \$28 net
 Sash (Auger Mortise). 60¢
 Common Senses. 60¢
 Empire. 60¢
 Ideal, Nos. 2, 4, 10 & 15. 40¢ less 1¢
 Acme. 40¢
 Star. 40¢
 On bbl. lots extra 5¢.
 Ideal, Nos. 25 and 55. \$22 net.

Pumps-

Cistern, Best Makers. 60¢@60¢10¢
 Pitcher Spout, Best Makers. 67¢@70¢
 Pitcher Spout, Cheaper G'ds. 75¢@75¢10¢

Punches-

Saddler's or Drive, good. \$10.00, 60¢@55¢
 Bemis & Call Co.'s Cast Steel Drive. 50¢@55¢
 Bemis & Call Co.'s Springfield Socket. 55¢
 Spring, good quality. \$10.00, 60¢@55¢
 Spring, Leach's Pat. 50¢@55¢
 Bemis & Call Co.'s Spring. 50¢@55¢
 Bemis & Call Co.'s Check. 55¢
 Solid Tinnings, P., S. & W. Co., \$10.00, 55¢
 Tinnings' Hollow Punches, P., S. & W. Co., 20¢
 Rice Hand Punches. 15¢
 Avery's Revolving. 40¢
 Avery's Sawset and Punch-See Sawsets
 Niagara Hollow Punches. 20¢@25¢
 Niagara Solid Punches. 55¢

Rail-

Sliding Door, Wrt Brass. \$10.00, 35¢, 40¢
 Sliding Door, Bronzed Wrt Iron. \$10.00, 35¢, 40¢
 Sliding Door, Iron, Painted. \$10.00, 35¢, 40¢
 Barn Door, Light. In. \$10.00, 35¢, 40¢
 Per 100 feet. \$2.00 2.50 3.10, 10¢
 B. D. for N. E. Hangers.
 Small. Med. Large.
 Per 100 feet. \$3.15 2.70 3.25 Net
 Terry's Steel Rail. \$10.00, 35¢, 40¢
 Victor Track Rail, 7¢ foot. 50¢@55¢
 Carrier, double braced, Steel Rail, 7¢ foot. 50¢@55¢
 Lundy Parlor Door, Flanged Edge, 7¢ foot. 50¢@55¢
 Moore's Steel Rail. 25¢@25¢
 Moody Steel Rail 7¢ ft. 55¢

Rakes-

Cast Steel, Association G'ds. 70¢@70¢55¢
 Cast Steel, outside G'ds. 70¢@70¢55¢
 Malleable. 70¢@70¢55¢
 Gibbs' Lawn Rake. \$10.00, 40¢
 Gibbs' Canton Lawn Rake. \$10.00, 40¢
 Gibbs' Acme Lawn Rake. \$10.00, 40¢
 Gibbs' Favorite Lawn Rake. \$10.00, 40¢
 Gibbs' Crown Lawn Rake, No. 1. \$10.00, 40¢
 Oneida Lawn Rake. \$10.00, 40¢
 Fort Madison Prize Bow Brace and Peetless. 65¢
 Fort Madison Steel Tooth Lawn Rake. \$10.00, 40¢

Razors-

J. R. Torrey Razor Co. Net prices
 Wootenholm and Butcher, \$10 to 40¢. 10¢
 Jordan's A.A.I., new list. Net prices
 Jordan's Old Faithful, new list. Net prices
 Galvanic. \$10.00, 40¢
 Electric Cutlery Co. Net prices
 Campbell Cutlery Co. 50¢

Razor Strops-

See Strops, Razor.

Registers -

Moore's Japanned. 75¢
 Moore's Electroplated. 75¢
 Moore's Bronze Finishes. 70¢
 Moore's Solid Bronze. 65¢
 Moore's Stove Pipe. 35¢

Rings and Ringers-

Bull Rings-
 Union Nut Co. 55¢
 Sargent's. 75¢@10¢
 Hotchkiss' low list. 30¢
 Humason, Beckley & Co.'s. 70¢@10¢
 Peck, Stow & W. Co.'s. 50¢@10¢10¢
 Ellrich Hdw. Co., White Metal, low list. 50¢@10¢10¢

Hog-

Top of the Hill Ringers. \$10.00, 20¢
 Top of the Hill Ringers. \$10.00, 20¢
 Hill's Improved Ringers. \$10.00, 20¢
 Hill's Old Style Ringers. \$10.00, 20¢
 Hill's Tongs. \$10.00, 20¢
 Hill's Ringers. \$10.00, 20¢
 Perfect Ringers. \$10.00, 20¢
 Perfect Ringers. \$10.00, 20¢
 Blair's Hog Ringers. \$10.00, 20¢
 Blair's Hog Ringers. \$10.00, 20¢
 Champion Ringers, Double. \$10.00, 20¢
 Brown's Ringers. \$10.00, 20¢
 Brown's Ringers. \$10.00, 20¢
 Electric Hog Ringers. \$10.00, 20¢
 Electric Hog Ringers. \$10.00, 20¢
 Major Ringers. \$10.00, 20¢
 Major Ringers. \$10.00, 20¢

Rivets and Burrs-

Norway Iron, list Nov. 17, '87. 60¢@10¢
 Second quality. 70¢
 Copper. 60¢@10¢
 Copper Iron, Betina Brand. 60¢@5¢

Rivet Sets-See Sets.**Roasting and Baking Pans-See Pans, Roasting and Baking.****Rods-**

Stair, Brass. 25¢@30¢
 Stair, Black Walnut. \$10.00, 40¢

Rollers-

Barn Door, Sargent's list. 60¢@10¢10¢
 Acme Moore's Anti-Friction. 55¢
 Union Barn Door Roller. 70¢
 Moore's Barn Door Stay. 50¢
 Thompson Mfg. Co.'s Lawn Rollers. 30¢

Rope-The following prices are f.o.b.

New York or factory, and are shaded 1/4¢ on large lots; terms, 1 1/2% for cash.
 Manila, 7-16 in. diam. and larger. 75¢@ 8¢
 Manila, 3/4 in. 84¢@ 8¢
 Manila, 1/2 and 5-16 in. 84¢@ 8¢
 Manila, Tarred Rope. 74¢@ 8¢
 Manila, Hay Rope, Med'm 74¢@ 8¢
 Sisal, 7-16 in. and larger. 54¢@ 5¢
 Sisal, 3/4 in. 7¢@ 7¢
 Sisal, 1/2 and 5-16 in. 64¢@ 5¢
 Sisal, Hay Rope. 54¢@ 5¢
 Sisal, Tarred Rope. 5¢@ 5¢
 Sisal, Medium Lath Yarn. 54¢@ 5¢
 New Zealand. 7-16 in. and larger. 54¢@ 5¢
 New Zealand, 3/4 inch. 54¢@ 5¢
 New Zealand, 1/2 and 5-16 in. 64¢@ 5¢
 New Zealand, Hay Rope. 54¢@ 5¢
 New Zealand, Tar'd Rope. 5¢@ 5¢
 Cotton Rope. 12¢@ 12¢
 Jute Rope. 6¢@ 6¢

Wire-

List February, 1892. All kinds. 45¢

Rules-

Boxwood. 50¢@10¢10¢80¢10¢10¢10¢
 Ivory. 50¢@10¢
 Starrett's Steel Rules and Straight Edges. 25¢@10¢

Sad Irons-See Irons, Sad.**Sand and Emery Paper and Cloth-**

See Paper and Cloth.

Sash Cord-See Cord, Sash.**Sash Locks-See Locks, Sash.****Sash Weights-**

See Weights, Sash.

Sausage Stuffers or Fillers-See Stuffers or Fillers, Sausage.**Saws-**

Note.-Extra 5¢@10¢ often given.
 Diston's Circular. 45¢@45¢55¢
 Diston's Cross Cut, list Jan. 1, '93. 40¢@10¢
 Diston's Hand. 25¢
 Woodrough & McParlin.
 Hand, Panel and Rip. 25¢@10¢
 Cross Cuts, list Jan. 1, 1893. 45¢@10¢
 Wheeler, Madden & Clemson Mfg. Co.
 Hand, Panel and Rip. 30¢@10¢
 Cross Cuts, list Jan. 1, 1893. 45¢@10¢
 Atkins' Circular. 50¢@10¢
 Atkins' Cross Cuts, new list. 40¢
 Atkins' Mulay, Mill and Drag. 60¢@10¢
 Atkins' One-Man Saw. 40¢
 Atkins' Wood Saws. 40¢
 Peace Circular and Mill. 45¢@45¢55¢
 Peace Hand Panel and Rip. 25¢@25¢55¢
 Peace Cross Cuts, list Jan. 1, '93. 45¢@10¢
 Richardson's Circular and Mill. 45¢@45¢55¢
 Richardson's S. Cuts, list Jan. 1, '93. 45¢@10¢
 Richardson's Hand, &c. 25¢@25¢55¢
 C. E. Jennings & Co.'s. 55¢
 Simonds' Circular Saws. 45¢@45¢55¢
 Simonds' Crescent Ground Cross Cut Saws. 30¢
 Simonds' Gang, Mill, Mulay and Drag Saws. 45¢@45¢55¢

Hack Saws-

Griffin's, complete. 40¢@10¢50¢
 Griffin's Hack Saw Blades. 40¢@10¢50¢
 Star Hack Saws and Blades. 25¢
 Eureka and Crescent. 25¢

Scroll-

Lester, complete, \$10.00. 25¢
 Rogers, complete, \$10.00. 25¢
 Barnes' Builders' and Cab Makers' \$15.25. 35¢
 Barnes' Scroll Saw Blades. 35¢
Saw Frames-
 See Frames, Saw.
Saw Sets-See Sets, Saw.
Saw Tools-See Tools, Saw.
Scales-
 Hatch, Counter, No. 171, good quality. \$10.00, 18¢@10¢10¢
 Hatch, Tea, No. 181. \$10.00, 18¢@10¢10¢
 Union Platform, Plain. \$2.10@2.20
 Union Platform, Striped. \$2.40@2.50
 Chatillon's Grocers' Trip Scales. 50¢
 Chatillon's Eureka. 25¢
 Chatillon's Favorite. 40¢
 Family Turnbills. 30¢@30¢10¢
 Riehle Bros' Platform. 40¢
Scale Beams-
 See Beams, Scale.
Scissors, Fluting- 45¢
Scrapers-
 Adjustable Box Scraper (S. R. & L. Co.) \$6.00. 30¢@10¢
 Box, 1 Handle. \$10.00, 20¢
 Box, 2 Handle. \$10.00, 20¢
 Defence Box and Ship. 20¢@10¢
 Foot. 50¢@10¢60¢
 Common. \$10.00, 20¢
 Ship, R. I. Tool Co. 10¢

Screen Window and Door

Frames-See Frames

Screw Drivers-

See Drivers, Screw

Screws-**Bench and Hand-**

Bench, Iron. 55¢@10¢55¢10¢10¢
 Bench, Wood, Beech. \$10.00, 20¢
 Bench, Wood, Hickory. 20¢@10¢
 Hand, Wood. 25¢@10¢25¢
 Hand, Grand Rapids, list. 35¢

Coach, Lag and Hand-Rail-

Lag, Blunt Point, list Jan. 1, 1890. 80¢@10¢80¢25¢
 Coach and Lag, Gimlet Point, list Jan. 1, 1890. 80¢@10¢80¢20¢
 Hand Rail, Sargent's. 70¢@10¢
 Hand Rail, H. & B. Mfg. Co. 70¢@10¢75¢
 Hand Rail, Am. Screw Co. 75¢

Jack Screws-

Jack Screws, Millers Falls list. 50¢@50¢10¢
 Jack Screws, P. S. & W. 35¢
 Jack Screws, Sargent. 70¢
 Jack Screws, Stearns'. 40¢@40¢10¢

Cork-

Humason & Beckley Mfg. Co. 40¢@10¢50¢
 Williamson's. 35¢@35¢45¢
 Williamson's Forged Worm, Applewood Handle, \$5.00; Rosewood, \$5.50
 Detroit Cork Screw Co. 35¢@35¢

Machine-

Flat Head Iron. 65¢
 Round Head Iron. 60¢

Wood-

List January 1, 1891.
 Flat Head Iron. 70¢
 Round Head Iron. 65¢
 Flat Head Brass. 70¢
 Round Head Brass. 65¢
 Flat Head Bronze. 70¢
 Round Head, Bronze. 65¢
 Rogers' Drive Screws. 82¢@

Scroll Saws-See Saws, Scroll.**Scythes-**

Grain. 40¢@50¢40¢10¢
 Grass. 40¢@10¢50¢

Scythe Snaths-

See Snaths, Scythe.

Sets-

Awl and Tool-
 Aiken's Sets, Awls and Tools. 60¢@80¢55¢
 Fray's Adj. Tool Hds., No. 1, \$12; 2, \$18; 3, \$12; 4, \$9.
 Millers Falls Adj. Tool Hds., No. 1, \$12; No. 4, \$12; No. 5, \$18.
 Henry's Combination Haft. \$10.00, 25¢
 Stanley's Excelsior. 30¢@10¢
 No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.
 Common Brad Sets. 70¢@10¢55¢
 No. 42, \$10.60; No. 43, \$12.50. 70¢@10¢55¢

Nail-

Square. \$1.00@1.25
 Round. \$1.25
 Buck Bros. 27¢
 Cannon's Diamond Point. \$1.25, 20¢

Rivet-

Regular list. 70¢

Saw-

Stillman's Genuine. \$5.00@7.75, 40¢@55¢
 Stillman's Pattern, Hand, \$10.00, 40¢@55¢
 Cross Cut, \$5.50. 55¢@55¢10¢
 Common Lever. \$10.00, 45¢@50¢
 Morrill's No. 1. \$15.00. 40¢@20¢
 No. 11, \$16.00. 40¢@20¢
 Nos. 3 and 4, Cross Cut, \$23.00. 40¢@20¢
 No. 5, Mill, \$31.00. 40¢@20¢
 No. 10, \$15.50. 40¢@20¢
 Leach's. No. 0, \$8.00; No. 1, \$15. 15¢@20¢
 Nash's. \$5.50, 10¢
 Hammer, Hotchkiss. 20¢@10¢40¢
 Hammer, Bemis & Call Co.'s new Pat. 45¢
 Bemis & Call Spring Hammer. 30¢@55¢
 Bemis & Call Co.'s Plate. 20¢
 Bemis & Call Co.'s Cross Cut. 30¢@55¢
 Aiken's Genuine. \$13.00, 50¢@10¢60¢
 Aiken's Imitation. \$10.00, 30¢@30¢
 Hart's Pat. Lever. \$3.00, 25¢
 Diston's Star. 25¢
 Leopold. 40¢@10¢50¢
 Atkin's Lever. \$10.00, 15¢
 Atkin's Criterion. \$10.00, 15¢
 Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00. 40¢@10¢50¢
 Avery's Saw Set and Punch. 50¢
 Kohler's Royal. \$10.00, 50¢
 Kohler's Giant Royal. \$10.00, 50¢
 Crescent. \$10.00, 50¢
 Lloyd's Acme. \$10.00, 50¢
 Taintor Positive. \$10.00, 50¢

Sharpeners, Knife-

Applewood Handles. \$10.00, 40¢
 Rosewood or Coccoloba. \$10.00, 40¢

Shaves, Spoke-

Iron. 45¢
 Wood. 30¢
 Bailey's (Stanley R. & L. Co.). 40¢@10¢
 Stearns'. 30¢@10¢
 Cincinnati. 25¢@10¢
 Goodell's \$10.00. 25¢

Shears-

American (Cast) Iron. 75¢@10¢75¢10¢55¢
 Barnard's Lamp Trimmers. \$10.00, 35¢
 Seymour's, list Dec. 1881. 60¢@10¢60¢10¢10¢55¢
 Heinisch's, list Dec. 1881. 60¢@10¢60¢10¢10¢55¢
 Heinisch's Tailor's Shears. 35¢@35¢
 Cast Steel Trimmers.
 First quality. 80¢@80¢10¢
 Second quality. 80¢@10¢80¢10¢10¢
 Acme Cast Shears. 10¢@10¢
 Diamond Cast Shears. 10¢
 Clipper. 30¢@10¢
 Victor Cast Shears. 75¢@10¢75¢10¢10¢
 Howe Bros. & Hubert, Solid Forged Steel. 40¢
 Hatch Cutlery Co., Solid Steel Forged. 60¢
 Davenport Cutlery Co. 60¢@60¢10¢
 Clausen brand, Japanned. 70¢
 Claus brand, Nickelplated, same list. 60¢
 Galvanic 3/4 to 9 in. \$1.00. \$1.00
 Electric Cutlery Co. Net
 Campbell Cutlery Co., Jap'd. 75¢
 Nickel Plated. 65¢

Tinners' Snips-

Wrt. Handles, Steel Blades. 30¢@20¢10¢
 Niagara Snips and Shears. 20¢@10¢
 Cast Handles, Laid with Steel. 40¢

Pruning Shears and Hook

Diston's Combined 'Pruning Hook and Saw. \$18.00, 20¢@10¢
 Diston's Pruning Hook. \$10.00, 10¢
 E. S. Lee & Co.'s Pruning Tools. 50¢@10¢70¢
 Pruning Shears, Henry's Pat. \$10.00, 35¢
 Henry's Pruning Shears. \$10.00, 35¢
 Wheeler, M. & C. Co., Combination. \$10.00, 35¢
 Dunlap's Saw and Chisel. \$10.00, 35¢
 J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25
 P., S. & W. Co. 60¢
 Levin Pruner No. 1, \$15.00 \$10.00, 40¢
 Levin Pruner No. 2, \$21.00 \$10.00, 40¢

Tinners', &c.-

Shears and Snips (P. S. & W.). 20¢@25¢
 Snips, J. Mallinson & Co. 35¢@35¢

Sheaves-

Sliding Door-
 M. W. Co., list July, 1888. 60¢@10¢60¢55¢
 R. & E., list Dec. 18, 1886. 55¢@20¢
 Corbin's list. 60¢@10¢25¢
 Patent Roller, Hatfield's. 75¢
 Russell's Anti-Friction, list Dec. 18, 1885. 60¢@25¢
 Moore's Anti-Friction. 50¢

Sliding Shutter-

R. & E., list Dec. 18, 1885. 60¢@10¢25¢
 Sargent's list. 70¢
 Reading list. 60¢@10¢10¢

Shells-

First quality 4, 8, 10 and 12 gauge. 25¢@10¢25¢
 First quality Rival, Club and Climax brands, 14, 16 and 20 gauge (\$7.50 list). 20¢@10¢25¢
 Prentiss. 40¢@25¢
 Star, Club, Rival and Climax Brands. 35¢@10¢25¢
 Smokeless brand, 12, 10, 16 gauge. 35¢@10¢25¢
 Trap brand, 12 and 10 gauge. 35¢@10¢25¢
 Seibold's Comb. Shot Shells. 15¢@25¢
 Brass Shot Shells, list quality. 60¢@25¢
 Brass Shot Shells, Club, Rival, Climax. 65¢@25¢

Shells, Loaded-

Standard list, July 18, 1890. 40¢@10¢10¢40¢10¢10¢55¢
 7¢ cash, 10 days.

Ship Tools-

L. & J. White. 20¢@5¢

Shoes, Horse, Mule, &c

Horse-
 Burden's, Perkins', Phoenix, Standard, Diamond State, Brydens' Boss and Crescent, at factory. \$4.00
 Brydens' Frog Pressure, at factory. \$5.00

Mule-

Add \$1 keg to above prices.

Ox Wrought-

Snaps, Harness, &c.

Anchor (T. & S. Mfg. Co.)	65c
Fitch's (Hristol)	50c to 10c
Hutchins	10c
Andrews	50c
Sargent's Patent Guarded	70c to 10c
German, new list	40c to 10c
Covert	50c to 10c
Covert, New Patent	50c to 10c
Covert, New R. E.	60c to 10c
Covered Spring	60c to 10c
Covered Saddle Works' Triumph	39c
John Prots Snaps	70c to 10c
Kelley & Woolworth's Steel Harness	50c to 10c

Snaths

Soythe	50c to 20c
--------	------------

Soldering Irons

See Irons, Soldering.

Spittoons, Cuspidors, &c.**Standard Fiberware**

Cuspidors, 8 1/2-inch, # doz., No. 5, 8; No. 5X, 8.	
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, 8.	

Spoke Shaves

See Shaves, Spoke.

Spoke Trimmers

See Trimmers, Spoke.

Spoons and Forks**Tinned Iron**

Sasting, Cen. Stamp, Co.'s list	70c to 10c
Solid Table and Tea, Cen. Stamp, Co.	70c to 10c
list	70c to 10c
Buffalo, S. S. & Co.	39c to 2c

Silver Plated

4 months or 5c cash 30 days	
Linden Brit. Co. Rogers	40c to 15c
Rogers & Hamilton	40c to 15c
C. Rogers & Bros	40c to 15c
Rogers & Bros	40c to 15c
Reed & Barton	40c to 15c
Wm. Rogers Mfg. Co.	40c to 15c
Simpson, Hall, Miller & Co.	40c to 15c
Holmes & Edwards Silver Co.	40c to 15c
L. Boardman & Son	50c to 12c

Miscellaneous

Holmes & Edwards Silver Co.	
No. 67 Mexican Silver	50c to 10c
No. 30 Silver Metal	50c to 10c
No. 24 German Silver	50c to 10c
No. 50 Nickel Silver	50c to 10c
No. 49 Nickel Silver	50c to 10c
Wm. Rogers Mfg. Co.	
Rogers' Silver Metal	50c to 10c
18c Rogers' German Silver	60c to 8c
22c Rogers' Nickel Silver	50c to 8c
Rogers & Hamilton	
Steel Goods	40c to 10c
Cimeter, Flatware	40c to 15c
Cimeter, Steel Goods	40c to 10c
Crown Hamilton, Flatware and Cutlery	30c
German Silver	50c to 60c
Nickel Silver	50c to 60c
Britannia	60c to 80c
Boardman's Nickel Silver, list July 1, 1891	60c to 7c
Boardman's Britannia Spoons, case lots	60c to 25c cash

Springs**Door**

Torrey's Rod, 39 in.	50c to 12c
Warner's No. 1, # doz. 150; No. 2, 35.40	
Gem (Coll), list April 19, 1889	55c to 10c
Star (Coll), list April 19, 1889	20c
Victor (Coll)	60c to 10c
Champion (Coll)	60c to 10c
Cowell's, No. 1, # doz. 18.00; No. 2, 15.00	
Rubber, complete, # doz. 4.50	55c to 10c
Hercules	50c to 10c
Phoenix	50c to 10c

Marriage, Wagon, &c.

Elliptic, Concord, Platform and Half Scroll	
60c to 10c to 10c to 10c or net prices	
CHM's Bolster Springs	25c

Squares

Steel and Iron

Nickel-Plated	80c to 10c to 80c to 25c
Try Square and T Bevels	60c to 10c
Disston's Try Square and T Bevels	50c
Winterbottom's Try and Miter	30c to 10c
Starrett's Micrometer Caliper Squares	25c

Avery's Flush Bevel Squares	40c
Avery's Protractor	50c

Squeezers**Fodder**

Blair's	# doz. 2.00
Blair's "Olimax"	# doz. 1.25

Porcelain Lined, No. 1

Wood, No. 2	# doz. 3.00, 35c
Wood, Common	# doz. 1.70 to 1.75
Dunlap's Improved	# doz. 3.75, 20c
Sammis, No. 1, 5c; No. 2, 3c; 12c	

Jennings' Star	# doz. 2.50
The Boss	# doz. 2.50
Dean's, No. 1, # doz. 3.50; 2, 3.35; 3, 1.90; Queen, 2.50	

Little Giant	50c to 50c
King	40c to 5c
Hotchkiss Straight Flash	# doz. 12.00
Silver & Co., Glass	# gro. 8.9c

Standard Fiber Ware

See Ware, Standard Fiber.

Staples

Barbed Blind, 1/2 in. and larger	# 2.70 to 7.4c
Barbed Blind, 1/2 in.	# 2.50 to 8c
Fence Staples, Galvanized	Same price
Fence Staples, Plain	as Brd Wire
Grand Crossing Tack Co.'s list	75c to 10c

Steelyards**Stocks and Dies**

Blacksmith's	
Waterford's Goods	35c
Butterfield's Goods	35c
Lightning Screw Plate	25c to 30c
Reece's New Screw Plates	25c to 30c
Reversible Ratchet	30c
Gardner	25c
Green River	55c to 30c

Steps Bench

Morrill's, # doz. No. 1, \$10.00; No. 2, \$11.00	
Hotchkiss	# doz. 5, 10c to 10c to 10c
Weston's, No. 1, \$10.00, 2, 3, 25c to 10c	

McGill's, # doz. 35c

Cincinnati	25c to 10c
Terrill's Nos. 1 and 2, # doz. 35c; No. 3, 35c	
Millers Falls	25c
Stearns	20c to 10c

Stones

See Grindstones.

Soythe Stones

Pike Mfg. Co., list April, 1892.

Cleveland Stone Co., list Nov. 1892.

Oil Stones, &c.

Pike Mfg. Co.	
Hindstone No. 1, # D. 8c	
Sand Stone	5c
Turkey Oil Stone, 4 to 8	40c to 40c
In	80c
Turkey Slips	32.00

Lily White Washita	80c
Rosy Red Washita	80c
Washita Stone, Extra	80c
Washita Stone, No. 1	40c
Washita Stone, No. 2	30c
Lily White Slips	80c
Rosy Red Slips	80c
Washita Slips, Extra	80c
Washita Slips, No. 1	70c
Arkansas Stone, No. 1, 3 to 8 in.	35c
Arkansas Stone, No. 1 1/2 to 8 in.	35c

Lake Superior	# D 13c
Lake Superior Slips	# D 20c

Stove Polish

See Polish, Stove.

Stretchers Carpet

Cast Steel, Polished	# doz. 22.3
Cast Iron, Steel Points	# doz. 75c to 80c
Socks	# doz. 1.75
Ballard's	25c to 25c to 10c

Strops Razor

Genuine Emerson	60c to 60c
Imitation	# doz. 2.00, 20c to 10c
Torrey's	Net prices
Badger's Belt and Com.	# doz. 2.00
Lamont Combination	# doz. 4.00
Jordan's Pat. Padded, list Nov. 1, 1891	50c
Electric Cutlery Co.	Net prices
Campbell Cutlery Co.	Net prices

Stuffer, Sausage

Miles' Challenge, # doz. 2.00	50c to 50c
Perry, # doz. No. 1, 50c; No. 2, 21.00	
Draw Cut No. 4, each \$30.00	20c
Enterprise Mfg. Co., list Jan 17, '93	25c
Silver's	40c to 10c

Sweepers, Carpet and Lawn

Bissell No. 5	# doz. 17.00
Bissell No. 2	# doz. 17.00
Bissell, Grand	# doz. 17.00
Standard	# doz. 22.00
Domestic	# doz. 22.00
Domestic, No. 2	# doz. 22.00
Grand Rapids	# doz. 22.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00	

Improved Parlor Queen	# doz. 27.00
Nickel	# doz. 22.00
Jannaped	# doz. 22.00
Excelsior	# doz. 22.00
Garland	# doz. 18.00
Queen	# doz. 22.00
Housewife's Delight	# doz. 15.00
Ladies' Friend	# doz. 15.00
Ladies' Friend No. 2	# doz. 15.00
Advance	# doz. 18.00
Our Leader	# doz. 19.00
Triumph	# doz. 20.00
Supreme	# doz. 22.00
Easy Jap'd, # doz. 22.00; Nickel, 22.00	
Gift Edge	# doz. 22.00
Acme	# doz. 22.00
Imperial	# doz. 22.00
Grand Republic	# doz. 22.00
Jap'd, # doz. 30.00; Nickel, 33.00	
Banner	Jap'd, # doz. 22.00; Nickel, 22.40
The Star	# doz. 22.00
Reliable	# doz. 22.00
Rapid Jap'd, # doz. 22.00; Nickel, 22.40	
Our Own	# doz. 22.00
Model	# doz. 22.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates	
5 dozen in 6 months	# doz. 1.00
10 dozen in 6 months	# doz. 2.00
Exception on L.F., when 10 dozen price is \$13.50, and 25 dozen \$13.00	

Lawn

Thompson Mfg. Co.	30c
-------------------	-----

Swings

Davies Lawn	25c
-------------	-----

Tacks, Brads &c.

List October 19, 1893. Old established straight weights. Short weight goods are sold at lower prices.

Carpet Tacks	
American, Blued	68c
American, Tin'd and Cop'd	70c
Steel, Bright and Blued	68c
Steel, Tinned and Coppered	70c
Swedes Iron, Tinned	72c
American Iron Tacks, Domestic	68c
Swedes Iron Tacks	
S. S., Blued	68c
S. S., Tinned	70c
Langc, Blued	55c
Langc, Tinned	60c
Gimp and Lace Tacks	
S. S., Blued	62c
S. S., Tinned	68c
Langc, Blued	55c
Langc, Tinned	60c

Basket and Trimmers' Tacks	52c
Langc	55c
S. S.	55c
Hungarian Nails	60c
Common and Patent Brads	55c
Leathered Tacks	10c
Brush Tacks, S. S.	60c
Looking Glass Tacks, S. S.	35c
Picture-Frame Points, S. 3	25c
Finishing Nails	60c
Trunk and Clout Nails	
Black	65c
Tinned or Coppered	67c
Basket Nails	60c
Chair Nails	52c
Cigar Box Nails	50c
Tin Capped Nails	50c

Double Point	90c to 10c to 10c to 10c
Wire Carpet Nails	50c to 10c
Claw Handle Carpet	# gross 4.00
Bonnie Blue	# box 1.50

Miscellaneous

Bill Nye Brad Box	4.00
Farlan Gilt Nails, cartoon	50
Home Tacks, No. 50 # case (12 cartons) \$30.00; No. 100, # case (12 cartons) \$72.00	
Rome Nails, No. 200, # case (12 cartons) \$30.00; No. 400, # case (12 cartons) \$60.00	
Upholsterers' Nails	50c to 10c

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list	50c to 10c
---	------------

See also Nails, Wire.**Tanks, Oil**

Emerald, S. S. & Co.: 30-gal. \$3.75; 60-gal. \$11 each	
60c to 10c to 25c	

Tapes, Measuring

American	40c to 40c to 10c
Excelsior, Special list	20c
Spring	40c
Chesterman's, Regular list	25c to 30c

Thermometers

Tin Case	80c to 80c to 10c
----------	-------------------

Thimble Skains

See Skains.

Ties, Bale

Steel.

Standard Wire, list

60c to 10c to 25c

Tinners' Shears, &c.

See Shears, Tinners' &c.

Tinware

Stamped, Jannaped and Piced, list Jan 20, 1897	70c to 10c to 70c to 25c
--	--------------------------

Tire Benders, Upsetters, &c.

See Benders and Upsetters.

Tire**Tobacco Cutters**

See Cutters, Tobacco.

Tools**Coopers**

Bradley's	20c
Barton's	30c to 20c to 5c
L. & J. White	20c to 5c
Liberton Mfg. Co.	25c
Sandusky Tool Co.	30c to 30c to 5c
Shaves Cincinnati Tool Co.	20c

Lumber

Ring Peavies, "Blue Line"	# doz. 20.00
Ring Peavies, Common	# doz. 18.00
Steel Socket Peavies	# doz. 22.00
Mail Iron Socket Peavies	# doz. 19.00
Cant Hooks, "Blue Line"	# doz. 14.00
Cant Hooks, Common Finish	# doz. 14.00
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish	# doz. 14.50
Cant Hooks, Mail Socket Clasp, Common Finish	# doz. 14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish	# doz. 12.00
Cant Hooks, Clip Clasp, Common Finish	# doz. 12.00
Hand Spikes	# doz. 6 ft., 15.00; 8 ft., 20.00
Pike Poles, Pike & Hook	# doz. 12 ft., 11.50; 16 ft., 12.50; 18 ft., 14.50; 18 ft., 17.50; 20 ft., 22.50
Pike Poles, Pike only	# doz. 12 ft., 10.00; 14 ft., 11.00; 16 ft., 13.00; 18 ft., 16.00; 20 ft., 20.00
Pike Poles, not ironed	# doz. 12 ft., 12.00; 14 ft., 13.00; 16 ft., 14.00; 18 ft., 15.00; 20 ft., 16.00
Setting Poles	# doz. 13 ft., 14.00; 14 ft., 15.00; 16 ft., 17.00
Swamp Hooks	# doz. 18.00

Saw

Atkins', new list	40c
Simonds'	33c

Transom Lifters

See Lifters, Transom.

Traps**Game**

Newhouse	40c to 40c to 5c
Onelida Pattern	75c to 75c to 10c
Game, Blake's Patent	40c to 10c to 5c

Mouse and Rat

Mouse Wood, Choker	# doz. 10c, 9c to 10c
Mouse, Round Wire	# doz. 1.50 10c
Mouse, Cage Wire	# doz. 3.50 10c
Mouse, Catch-em-alive	# doz. 2.50 10c
Mouse, Bonanza	# doz. 0.90 to 1.00
Rat, Decoy	# gr. 10.00, 10c
Ideal	# gr. 10.00, 10c
Cyclone	# gr. 5.25
Hotchkiss Metallic Mouse, 6-hole traps	# doz. 60c to 65c
Hotchkiss Imp. Rat Killer	# doz. 1.50
Hotchkiss New Rat Killer	# doz. 1.50
Schuyler's Rat Killer	# gro. 15.00
Dandy	# doz. 1.75
Wadd	

Whips

American Whip Co.: Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	35.00	36.00
Eureka, Two-thirds Whalebone.....	15.00	16.50	18.00	20.00				
Bull Bone, Half-length Whalebone.....								
American Standard.....	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center.....	8.00	8.00	8.50	9.00	10.00	11.00	12.00	13.00
New Name, Stocked Java, Black and Wine Colors.....								
American, 93 Pen Whip.....				8.00				
Gents' Light Driving No. 111.....				8.00				
Gents' Light Driving No. 108.....				8.00				
Hand-made Stocked Java No. 103.....			8.75	4.00				
A large variety of cheaper grades.....								
Team Whips.....								
Toy Whips.....								
Hardware Assortment, 10/American, 75 Whips for \$50.00.								

Wire and Wire Goods—

Iron—	Stone, Br. and Ann'd.	Extra 10%
Marked,	Nos. 16 to 18.....	80%
Br. & Ann. Nos. 0 to 18.....	Nos. 19 to 28.....	80% to 85%
75¢10¢75¢10¢	Nos. 27 to 36.....	82% to 85%
Gal'd, Nos. 0 to 18.....	Tinned Broom Wire, 18 to 21, # 2.....	44%
70¢5¢70¢10¢	Galvanized Fence, 18 to 21, # 2.....	75¢10¢
70¢5¢70¢10¢	Brass, list Jan. 18, 1893.....	40¢5¢
70¢5¢70¢10¢	Copper, list Jan. 18, 1893.....	40¢5¢
70¢5¢70¢10¢	Annealed Wire on Spools.....	60%
70¢5¢70¢10¢	Malin's An'led & Tin'd on Spools.....	60¢5¢
70¢5¢70¢10¢	Malin's Brass and Cop. on Spools.....	50¢5¢
70¢5¢70¢10¢	Ossawan Mills, An'd and Tinned on Spools.....	60¢10%

Ossawan Mills, Brass and Copper on Spools.....	50¢10%
Tate's Spooled, Tin'd & Annealed.....	60¢5¢
Tate's Spooled Cop. and Brass.....	50%
Cast Steel Wire.....	50%
Stub's Steel Wire.....	\$6.00 to \$2.80
Steel Music Wire, 12 to 30, imported.....	50¢70¢
Wire Clothes Line, see Lines.....	
Wire Picture Cord, see Cord.....	
Bright Wire Goods—	
Standard list.....	85¢10¢85¢10¢10%
Wire Cloth and Netting.....	
Painted Screen Cloth # 100 ft.....	\$1.40
Galvanized Wire Netting.....	75¢10¢80%

Wire Barb—	See Trade Report.
Wire Rope—	See Rope, Wire.
Wrenches—	
American Adjustable.....	40%
Baxter's Adjustable "8".....	40¢10¢50%
Baxter's Diagonal.....	60%
Coe's Genuine.....	50¢50¢10%
Coe's "Mechanics".....	50¢10¢3%
Girard Standard.....	85¢10¢70%
Lamson & Sessions' Engineers'.....	80¢10%
Lamson & Sessions' Standard.....	70¢10%
P. S. & W. Agricultural.....	
Girard Agricultural.....	
Lamson & Sessions' Agric'l.....	75¢10¢80%
W. & B. Diamond.....	

Bemis & Call's:	
Pat. Combination Bright.....	40¢5¢
Pat. Combination Black.....	40¢10%
Merrick's Pattern.....	45%
Brigg's Pattern.....	30¢10%
Cylinder or Gas Pipe.....	45¢5¢
No. 3 Pipe.....	\$6.00, 50¢10%
Allen's Pocket (Bright).....	\$4.00, 50¢10%
The Favorite Pocket.....	\$4.00, 50¢10%
Webster's Pat. Combination.....	25%
Boardman's.....	30%
Always Ready.....	25¢5¢
Alligator.....	50%
Donohue's Engineer.....	20¢10%
Eagle.....	50¢10%
Acme, Bright.....	50¢2%
Acme, Nickle'd.....	40¢2%
Hercules.....	70¢70¢5%
Walker's.....	55¢3%
Diamond Steel.....	55¢3%
Cincinnati Brace Wrenches.....	25¢10%
Tatler Vise Wrench.....	55¢10¢3%

Wringers, Clothes—	
Am. Wringer Co.'s list, July 1, '93.....	2% cash
Colby Wringer Co., list Sept. 1, '91.....	2% cash
Lowell Mfg. Co., list July 1, 1892.....	2% cash
Peerless Mfg. Co., list Feb. 1892.....	2% cash
National Wringer & Mfg. Co., list June 1, 1892.....	2% cash
Wrought Goods—	
Staples, Hooks, &c., list, March 17, 1892.....	85¢10¢85¢15%

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw.....	47
Linseed, City, boiled.....	50
Linseed, Western, raw.....	47
Lard, City, Extra Winter.....	73
Lard, City, Prime.....	72
Lard, City, Extra No. 1.....	50
Lard, City, No. 1.....	45
Lard, Western, prime.....	72
Cotton-seed, Crude, prime.....	27
Cotton-seed, Crude, off grades.....	25
Cotton-seed, Summer Yellow, prime.....	33
Cotton-seed, Summer Yellow, off grades.....	30
Sperm, Crude.....	65
Sperm, Natural Spring.....	66
Sperm, Bleached Spring.....	71
Sperm, Natural Winter.....	71
Sperm, Bleached Winter.....	76
Whale, Crude.....	45
Whale, Natural Winter.....	45
Whale, Bleached Winter.....	48
Whale, Extra Bleached.....	50
Sea Elephant, Bleached Winter.....	35
Menhaden, Crude, Sound.....	39
Menhaden, Crude, Southern.....	40
Menhaden, Light Pressed.....	43
Menhaden, Bleached Winter.....	46
Menhaden, Extra Bleached.....	55
Tallow, City, prime.....	55
Tallow, Western, prime.....	54
Cocoonut, Ceylon.....	54
Cocoonut, Cochiti.....	54
Cod, Domestic.....	38
Cod, Foreign.....	42
Red Elaine.....	44
Red Saponified.....	44
Bank.....	38
Straits.....	58
Olive, Italian, bbls.....	58
Neatsfoot, prime.....	50
Palm, prime, Lagos.....	74

Mineral Oils—	
Black, 29 gravity, 25 @ 30 cold test.....	7
Black, 29 gravity, 15 cold test.....	7 1/2
Black, 29 gravity, summer.....	6
Cylinder light, filtered.....	14

Cylinder, dark, filtered.....	10
Paraffine, 25% @ 24 gravity.....	11
Paraffine, 25 gravity.....	10
Paraffine, 28 gravity.....	7 1/2
Paraffine, red.....	6 1/2

Paints and Colors—	
Barytes, Foreign, 10 ton.....	\$22.00
Barytes, Amer. floated.....	\$29.00
Barytes, Amer. No. 1.....	\$18.00
Barytes, Amer. No. 2.....	\$13.00
Barytes, Amer. No. 3.....	\$11.00
Blue, Celestia.....	6
Blue, Chinese.....	40
Blue, Prussian.....	25
Blue, Ultramarine.....	8
Brown, Spanish.....	1 1/2
Brown, Vandyke, Amer.....	3
Brown, Vandyke, English.....	3
Carmine, No. 40, in bulk.....	2.75
Carmine, No. 40, in boxes or barrels.....	2.85
Carmine, No. 40, in ounce bottles.....	3.75
Chalk, in bulk.....	1.75
Chalk, in bbls.....	35
China Clay, English.....	10
Cobalt Oxide, prep'd.....	9.00
Cobalt Oxide, black.....	10
Cobalt Oxide, black, lots 100 lb.....	1.90
Green, Paris, 170 @ 175 lb.....	10
Green, Paris, small pack.....	12
Green, Chrome, ordinary.....	6
Green, Chrome, pure.....	22
Lead, Eng., B.B. white.....	8 1/2
Lead, Amn. White, dry or in oil.....	7
Kegs, lots less than 500 lb.....	6 1/2
Kegs, lots 500 lb to 5 tons.....	6 1/2
Kegs, lots 5 tons to 12 tons.....	6 1/2
Kegs, lots 12 tons and over.....	6 1/2
Lead, White, in oil, 25 lb tin.....	1 1/2
Lead, White, in oil, 12 1/2 lb tin.....	1 1/2
Lead, White, in oil, 1 to 5 lb asorted tins, add to keg price.....	2 1/2
Lead, Red, bbls, and 1/2 bbls.....	6
Lead, Red, kegs.....	6 1/2
Litharge, kegs.....	6 1/2
Litharge, bbls, and 1/2 bbls.....	6

Terms, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.	
Ocher, Rochelle.....	1.35
Ocher, French Washed.....	1 1/2
Ocher, German Washed.....	1 1/2
Ocher, American.....	1 1/2
Orange Mineral, English.....	8 1/2
Orange Mineral, French.....	10
Orange Mineral, German.....	8 1/2
Orange Mineral, American.....	8 1/2
Paris White, English Cliff.....	1.00
Paris White, American.....	65
Red, Indian, English.....	5 1/2
Red, Indian, American.....	2
Red, Turkey.....	9
Red, Tuscan.....	9
Red, Venetian, American.....	100 lb
Red, Venetian, English.....	1.20
Sienna, Italian, Burnt and Powder.....	4
Sienna, Ital., Burnt Lumps.....	1 1/2
Sienna, Ital., Raw, Powder.....	4 1/2
Sienna, Ital., Raw, Lumps.....	1 1/2
Sienna, American, Raw.....	1 1/2
Sienna, American, Burnt and Powdered.....	1 1/2
Talc, French.....	1 1/2
Talc, American.....	1 1/2
Terra Alba, Fr'ch.....	95
Terra Alba, English.....	70
Terra Alba, American No. 1.....	65
Terra Alba, American No. 2.....	45
Umber, Turkey, Burnt and Powdered.....	3 1/2
Umber, Turkey Bnt. Ln.....	2 1/2
Umber, Turkey, Raw and Powdered.....	3 1/2
Umber, Turkey, Bnt. Amer.....	2 1/2
Umber, Turkey, R'w Amer.....	1 1/2
Yellow, Chrome.....	10
Vermilion, American Lead.....	11 1/2
Vermilion, Quicks'cr, bulk.....	53
Vermilion, Quicks'cr, bags.....	54
Vermilion, Quicksilver sm'r.....	62
Vermilion, English Import.....	85
Vermilion, Imitation, Eng.....	8
Vermilion, Trieste.....	90
Vermilion, Chinese.....	92 1/2
Whiting Common, # 100 lb.....	37 1/2
Whiting Gliders.....	45

Zinc, American, dry.....	3 1/2
Zinc, French, Red Seal.....	7 1/2
Zinc, French, Green Seal.....	9
Zinc, French, V. M. X.....	7 1/2
Zinc, Antwerp, Red Seal.....	7 1/2
Zinc, Antwerp, Green Seal.....	7 1/2
Zinc, German, L. Z. O.....	6 1/2
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and lots less than 1 ton.....	10 1/2
Zinc, V. M. in Poppy Oil, Red Seal.....	10
lots of 1 ton and over.....	10
lots of less than 1 ton.....	10 1/2
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 15; 25 bbls, 2%; 50 bbls, 4%. No discount allowed on less than bbl. lots.	

Colors in Oil—	
Black, Drop, Frankfurt.....	25
Black, Drop, English.....	12
Black, Drop, Domestic.....	7
Black, Lampblack, Best.....	20
Black, Lampblack, Common.....	8
Black, Ivory.....	8
Blue, Chinese.....	35
Blue, Prussian.....	20
Blue, Ultramarine.....	12
Brown, Vandyke.....	7
Green, Chrome.....	8
Green, Paris.....	16
Sienna, Raw.....	7
Sienna, Burnt.....	7
Umber, Raw.....	7
Umber, Burnt.....	7

Putty—	
In barrels and 1/2 bbls.....	.013¢ @ .013¢
In tubs.....	.015¢ @ .013¢
In tin cans.....	.012¢ @ .024¢
In bladders.....	.012¢ @ .024¢

Spirits Turpentine—	
In regular bbls.....	29
In machine bbls.....	29 1/2

Glue—	
Low Grade.....	8
Cabinet.....	12
Medium White.....	13
Extra White.....	17
French.....	10
English.....	10
Irish.....	12

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron and Metal Trades, and a standard authority on all matters relating to those branches of industry.

RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

UNITED STATES AND BRITISH AMERICA.	
Weekly Edition, Issued every THURSDAY morning.....	\$4.50 a year.
Semi-Monthly Edition, First and THIRD THURSDAYS of every month.....	2.30 "
Monthly Edition FIRST THURSDAY of every month.....	1.15 "

ALL OTHER COUNTRIES.	
Weekly Edition: \$5.00=£1=25 francs=20 marks=11 florins=6 roubles (coin)=25 lire=20 pesetas.	
Semi-Monthly Edition: \$2.50=£10=12 1/2 francs=10 marks=6 florins=3 roubles (coin)=12 1/2 lire=10 pesetas.	
Monthly Edition: \$1.25=£5=6 1/4 francs=5 marks=3 florins=1 1/2 roubles (coin)=6 1/4 lire=5 pesetas.	

RATES OF ADVERTISING: ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION	ONE MONTH	THREE MONTHS	SIX MONTHS	ONE YEAR
\$2.00	7.50	17.50	\$30.00	50.00
New York (Main Office), 96-102 Reade Street,				
Philadelphia, 220 South Fourth Street,				
Pittsburgh, Room 509, Hamilton Building.				
Chicago, 59 Dearborn Street, cor. Randolph,				
Cincinnati, Rooms 22-24 Pickering Building,				
St. Louis, Bank of Commerce Building,				
Boston, 146 Franklin Street,				
Cleveland, 312 The Cuyahoga,				

BRITISH AGENCY: Office of The Ironmonger, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth St.; Sydney, 234 Clarence St.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received. Newsdealers or Booksellers in any part of the world may obtain The Iron Age through The American News Company, New York, U. S. A., The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter

CURRENT METAL PRICES.

DECEMBER 27, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron:	
3/4 to 2 in. round and square	per lb 1.80 @ 1.90¢
1 to 6 in. x 3/4 to 1 in.	
Refined Iron:	
3/4 to 2 in. round and square	per lb 1.90 @ 2.00¢
1 to 4 in. x 3/4 to 1 1/2 in.	
4 1/2 to 6 in. x 3/4 to 1 in.	
1 to 6 in. x 3/4 and 5-16	per lb 2.10 @ 2.20¢
Rods—3/4 and 1-1/2 round and sq.	per lb 2.00 @ 2.10¢
Bands—1 to 6 x 3-16 to No. 12	per lb 2.20 @ 2.30¢
"Burden Best" Iron, base price	per lb 3.00¢
Burden's "H. B. & S." Iron,	
base price	per lb 2.80¢
"Ulster"	per lb 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.00¢

Merchant Steel from Store—

Open-Hearth and Bessemer Machinery,	
Toe Calk, Tire and Sleigh Shoe, base	
price in small lots	2 1/2¢
Best Cast Steel, base price in small lots	8¢
Best Cast Steel Machinery, base price in	
small lots	5¢

Sheet Iron from Store—

Black—

Nos. 14 to 20	3 @ 3 1/4¢
21 to 24	3 1/4 @ 3 3/4¢
25 to 26	3 3/4 @ 3 1/2¢
27	3 1/2 @ 3 3/4¢
28	3 3/4 @ 3 1/2¢
Common 1/4¢ less than the above.	

Open Hearth Steel.

Best Soft Steel, Nos. 14 to 16	2 1/2 @ 2 3/4¢
" " " 18 to 20	2 3/4 @ 3¢
" " " 21 to 24	3 @ 3 1/4¢
" " " 25 to 26	3 @ 3 3/4¢
" " " 27 to 28	3 @ 3 1/2¢
Best Bloom Sheets, 1/4¢ extra over above prices.	
Best Bloom, Galvanized, jobbing dis. 70 @ 70 1/2¢	
Ordinary Bessemer, 1/4¢ @ 1/4¢ lower than	
above prices.	

Russia, Planished, &c.

Genuine Russia, according to	
assortment	per lb 12¢ @ 13¢
Patent Planished	per lb A, 10¢; B, 9¢, 5¢
Craig Polished Sheet Steel	per lb B, 8 1/2¢

Foreign Steel from Store—

Best Cast	per lb 15¢
Extra Cast	per lb 16 1/2¢
Swaged Cast	per lb 16¢
Best Double Shear	per lb 15¢
Blister, 1st quality	per lb 12¢
German Steel, Best	per lb 10¢
2d quality	per lb 9¢
Sheet Cast Steel, 1st quality	per lb 15¢
2d quality	per lb 14¢
3d quality	per lb 12 1/2¢
R. Mushet's "Special"	per lb 48¢
" " " " Annealed	per lb 75¢
" " " " " " " "	per lb 20¢
Eicken's Special No. 8	per lb 30¢
Extra	per lb 15¢

METALS—

Tin—

Banca, Pigs	22 1/2¢ @ 22 3/4¢
Straits, Pigs	21¢ @ 22¢
Straits in Bars	22 1/2¢ @ 23¢

Tin Plates—

Duty: 2 1/2¢ per lb.

Charcoal Plates—Bright—

Guaranteed Plates command special prices,	
according to quality.	Per box.
Melyn and Calland Grade—IC, 10 x 14	@ \$6.50
" " " " " " " " " " " "	@ 6.75
" " " " " " " " " " " "	@ 6.50
" " " " " " " " " " " "	@ 13.00
" " " " " " " " " " " "	@ 8.50
" " " " " " " " " " " "	@ 8.75
" " " " " " " " " " " "	@ 8.50
" " " " " " " " " " " "	@ 17.00
" " " " " " " " " " " "	@ 6.00
" " " " " " " " " " " "	@ 8.00
" " " " " " " " " " " "	@ 6.25
Allaway Grade—IC, 10 x 14	@ 6.00
" " " " " " " " " " " "	@ 7.50
" " " " " " " " " " " "	@ 7.75
" " " " " " " " " " " "	@ 7.50
" " " " " " " " " " " "	@ 15.00
" " " " " " " " " " " "	@ 5.50
" " " " " " " " " " " "	@ 7.00

Coke Plates—Bright—

Steel Coke—IC, 10 x 14, 14 x 20	@ \$5.50
" " " " " " " " " " " "	@ 8.50
" " " " " " " " " " " "	@ 12.00
" " " " " " " " " " " "	@ 7.00
BV Grade—IC, 10 x 14, 14 x 20	@ 5.50

Charcoal Plates—Terne—

Guaranteed Plates command special prices	
according to quality.	
Dean Grade—IC, 14 x 20	@ \$5.85
" " " " " " " " " " " "	@ 11.00
" " " " " " " " " " " "	@ 6.40
" " " " " " " " " " " "	@ 12.80
Abecarne Grade—IC, 14 x 20	@ 5.55
" " " " " " " " " " " "	@ 10.75
" " " " " " " " " " " "	@ 6.40
" " " " " " " " " " " "	@ 12.80

Tin Boiler Plates—

IXX, 14 x 28	112 sheets	@ \$18.35
IXX, 14 x 28	112 sheets	@ 14.50
JXX, 14 x 31	112 sheets	@ 16.00

American Terne Plates—Apollo.

IC, 14 x 20	@ \$6.25
IX, 20 x 28	@ 12.50
IX, 14 x 20	@ 7.25
IX, 20 x 28	@ 14.50

Copper—

DUTY: Pig, Bar and Ingot, 1 1/4¢; Old Copper, 1¢
per lb. Manufactured (including all articles of
which Copper is a component of chief value),
35¢ ad valorem.

Ingot—

Lake	@ 11¢
Ansonia grade Arizona	@ 10 1/4¢
Ansonia grade Casting	@ 10¢

Sheet and Bolt—

Prices adopted by the Association of Copper
Manufacturers of the United States, May
19, 1892. Subject to a discount of 15¢ @ 35¢,
according to size of order. Stubs' gauge
standard.

Not wider than	Not longer than	And longer than	Weights per sq. foot and prices per pound.							
			Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		23	22	22	23	24	25	26	30
30		72	23	22	22	23	24	25	27	31
36	96		22	22	22	24	26	30	33	
36		96	22	22	22	25	27	31	35	
48	96		22	22	24	26	28	32		
48		96	22	22	25	27	29	33		
60	96		22	22	27	29	34			
60		96	22	23	28					
84	96		23	24						
84		96	24	25						
Ovr 84 in. wide			25	27						

Bolt Copper, 3/4 inch diameter and over, 22¢
Circles, Segments and Pattern Sheets, 60 in.
diameter and less, 3¢ per lb advance over prices
of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 60
in. diameter, up to 96 in. diameter inclusive,
4¢ per lb advance over prices of Sheet Copper
required to cut them from.
Circles, Segments and Pattern Sheets, over 96
in. diameter, 5¢ per lb advance over prices of
Sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. square foot
and heavier, 1¢ per lb over the foregoing prices.
Cold or Hard Rolled Copper lighter than 14 oz.
square foot, 2¢ per lb over the foregoing prices.
All Polished Copper over 20 in. wide, 2¢ per lb
advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

14 ounce to square foot and heavier	23¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢
Circles less than 8 inches diameter, 2¢ per lb additional.	
Circles over 13 inches diameter are not classed as Copper Bottoms.	
15¢ @ 25¢ discount, according to size of order.	

Copper Wash Bowl Bottoms—

Tinned	per lb 34¢, 15¢ @ 25¢
--------	-----------------------

Tinning—

Tinning sheets on one side, 10, 12 and 14 x 48	each	8¢
Tinning sheets on one side, 30 x 60 each		30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each		15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each		12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each		12¢
Tinning sheets on one side, other sizes, per square foot		2 1/2¢
For tinning both sides double the above prices.		

Planished Brass and Copper—

Not larger than 30 x 60.	
16 oz. and heavier	24¢ per lb
14 oz.	25¢ per lb
12 oz.	27¢ per lb

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Net.											
O. G.	N. G.	3/4	1/2	3/8	1/4	3/16	1/8	1/16	1/32	1/64	1/128
8-14	6-12	32	28	25	24	23	22	21	20	19	18
15	13	33	29	26	25	24	23	22	21	20	19
16	14	34	29	27	26	25	24	23	22	21	20
17	15	35	30	28	27	26	25	24	23	22	21
18	16	37	31	29	27	26	25	24	23	22	21
19	17	38	32	30	29	28	27	26	25	24	23
20	18-19	39	34	32	31	30	29	28	27	26	25
21	20	41	36	34	33	32	31	30	29	28	27
22	21	43	37	35	34	33	32	31	30	29	28
23	22	45	39	37	36	35	34	33	32	31	30
24	23	48	41	39	38	37	36	35	34	33	32
25	24	51	44	41	40	39	38	37	36	35	34

Copper, Bronze and Gliding Tube, 3/4¢ per lb additional
Braided Brass Tubing (To No. 20 inclusive.)
Brown & Sharpe's gauge standard.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, 1/4 inch	60¢
Plain, 3-16 inch	60¢
Plain, 1/2 inch	\$1.00
Fancy Tubing, Brass to No. 20, inclusive	\$1.50
Brass Tubing, 3/4¢ per lb more than Brass.	
Discount from list	30¢ @ 1/2¢

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2	in. 10	in. 12	in. 14	in. 16	in. 18	in. 20	in. 22	in. 24
Te No. 20, inclusive	31	23	23	25	27	29	31	33	
Nos. 21, 22, 23 and 24	23	23	24	26	28	30	32	34	
Nos. 25 and 26	23 1/2	23 1/2	24 1/2	27	29 1/2	31 1/2	33 1/2	35 1/2	
Nos. 27 and 28	24	24	25	28	30 1/2	32 1/2	34 1/2	36 1/2	

Common High Brass: Wider than and including	in. 24	in. 26	in. 28	in. 30	in. 32	in. 34	in. 36	in. 38	in. 40
To No. 20, inclusive	36	39	42	46	50	55	60	65	
Nos. 21, 22, 23 and 24	37	40	43	47	51	56	61	68	
Nos. 25 and 26	38	41	44	48	52	57	63	71	
Nos. 27 and 28	39	42	45	49	53	58	65	75	

Discount from List 15¢ to 25¢.

Brass and Copper Wire—

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive	\$0.22	\$0.24	\$0.26	\$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 and No. 20	.24	.26	.28	.32
No. 21, or 0.032 diameter	.25	.27	.29	.33

Discount 15¢ to 25¢.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22	\$0.26	\$0.28	\$0.30	\$0.34
No. 23	.28	.30	.32	.36
No. 24	.30	.32	.34	.38
No. 25	.32	.34	.36	.40
No. 26	.35	.37	.39	.43
No. 27	.38	.40	.42	.46
No. 28	.42	.44	.46	.51
No. 29	.45	.47	.49	.54
No. 30	.48	.50	.52	.58
No. 31	.51	.53	.55	.61
No. 32	.55	.57	.59	.65
No. 33	.59	.61	.63	.69
No. 34	.64	.66	.68	.75
No. 35	.70	.72	.74	.80
No. 36	.76	.78	.80	.85
No. 37	1.00	1.02	1.04	1.10
No. 38	1.30	1.32	1.34	1.40
No. 39	2.00	2.02	2.04	2.10
No. 40	2.60	2.62	2.64	2.75

— discount.
Spring Wire, 2¢ per lb advance.

Copper Belt and Hose Rivets and Burrs—

Per lb.		Per lb.	
No. 5	49¢	No. 11	66¢
No. 6	49¢	No. 12	68¢
No. 7	49¢	No. 13	69¢
No. 8	50¢	No. 14	70¢
No. 9	52¢	No. 15	70¢
No. 10	54¢		
60¢ @ 5¢ discount.			

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.	
1/4 to 3/4 inches inclusive	17¢ per lb
Over 3/4 to 5 inches inclusive	18¢ per lb
Piston Rods, Finished True, Smooth and Straight.	
1/4 to 3/4 inches inclusive	18¢ per lb
Over 3/4 to 5 inches inclusive	19¢ per lb

Spelter—

Duty: Pig, Bars and Plates, \$1.50 per 100 lb.	
Western Spelter	4 1/2¢
Bertha (pure)	8¢ @ 8 1/2¢

Zinc—

Duty: Sheet, 2 1/2¢ per lb.	
600 lb casks	5 1/2¢
Per lb	6¢ @ 6 1/2¢

Lead—

Duty: Pig, \$2 per 100 lb. Old Lead, 2¢ per lb. Pipe and Sheets, 2 1/2¢ per lb.	
American Pig	4¢ @ 4.10
Bar, subject to discount 20%	0 1/2¢
Pipe, subject to discount 20%	0 1/2¢
Tin-Lined Pipe, subject to discount 20%	1¢
Block Tin Pipe, subject to discount 20%	37 1/2¢
Sheet, subject to discount 20%	37 1

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

GoogleTM books

<https://books.google.com>

